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track one

The Waiting Game

onsumer-electronics manufacturers, listen up:
We're intrigued by the new technology, particularly things like DVD that push the home-entertainment experience to new levels. We take great pride in owning, maintaining, and (more or less) continually upgrading systems that can recreate the nuances of a live concert and rival the sound and picture quality you find in the very best movie theaters. But we're *not* willing to shell out big bucks for gear that's overly complicated or shackled with performance restrictions — or both. And when it comes to high-definition TV, DVD-Audio, and Super Audio CD (SACD), in particular, we'd rather wait until the dust settles than risk buying gear that might be obsolete in a few years.

If there was a common theme among the hundreds of responses to my informal reader survey (June), that was it. In the case of HDTV, 75% of survey participants said they have no immediate plans to buy a high-def TV or monitor, with many citing high prices, the scarcity of high-def programming, and confusing technical standards as major stumbling blocks.

As one reader from Amsterdam, New York, put it, "I don't plan on buying HDTV in the near future because of the mess it is in." A cynical correspondent from Geneva, Florida, noted, "Thanks to Jack Valenti [president of the Motion Picture Association of America] and his gang of thugs, we'll be lucky if we are actually allowed to watch an HDTV broadcast on an HDTV set." (He wasn't the only one to mention Valenti by name.) As for survey respondents who've already made the HDTV plunge, or plan to in the coming year, the allure can be summed up in three words: "fantastic picture quality."

On DVD-Audio and SACD players, once again a solid 75% of respondents said they had no plans to buy a player for either format in the near future, citing price, the small number of titles available, and the prospect of a format war as key reasons for shying away. Typical was this comment from a reader in Newtown, Pennsylvania: "DVD-Audio and SACD are like VHS and Beta, and I don't want to pick the wrong one." A number of people said they're holding out for a "universal" player that can play all kinds of discs. Popular gripes about the hardware included the lack of bass-management facilities and digital outputs. About 10% of the respondents, in explaining why they had no plans to upgrade to either new audio format, simply said, "CDs are fine" or "Ster-

eo is fine." Among the 15% of respondents who said they *had* bought a new player, the breakdown was 60/40 DVD-Audio vs. SACD.

DVD favorites, in order of popularity, were fairly predictable, with *The Matrix* and *Gladiator* claiming the top two spots, followed by *The Terminator* and *T2*. Runners-up included *Saving Private Ryan*, *The Mummy*, and *Lawrence of Arabia*. Music DVDs made a fairly strong showing, with the Eagles' *Hell Freezes Over* receiving the most mentions.

Nearly half of the Favorite CD mentions were in the pop/rock vein, followed by classical, jazz, and country. Leading the way were the Beatles (mostly the recent singles compilation, *The Beatles 1*) and Miles Davis (*Kind of Blue*) practically in a dead heat, followed by Pink Floyd (mostly *Dark Side of the Moon*) and Santana (*Supernatural* plus a few old gems like *Abraxas*). Beyond these, only a handful of titles were mentioned by more than one respondent, and more than a few were pretty obscure, like *In the Dance Tent* by the Horse Flies. In classical music, works by Beethoven and Mahler were mentioned most often.

Test reports were cited most frequently as a favorite part of this magazine, with the reports on the Pioneer Elite Pro-510HD 53-inch HDTV monitor, the Harman Kardon AVR 510 digital surround receiver, and Denon's DVD-2800 DVD player getting more votes than any of the others in that issue.

Finally, Tom Nousaine's "Subway Series," a comparison of eight subwoofers, received the most mentions in the Favorite Feature category, followed by Al Griffin's "Seeing the Digital Light" (an introduction to digital light processing video technology), and Ivan Berger's "Radio Reborn."

That's it for now. I hope you enjoy our speaker special, which begins on page 80 with Dan Kumin's "Anatomy of a Speaker System."

Bob Ankosko, Editor in Chief

Bet line

P.S. Thanks to all who took the time to respond — especially those who went the extra mile to seek out our correct e-mail address. We printed a bum one. D'oh!

Readers who responded to our June survey said they'd rather wait until the dust settles than risk buying gear that might be obsolete in a few years.





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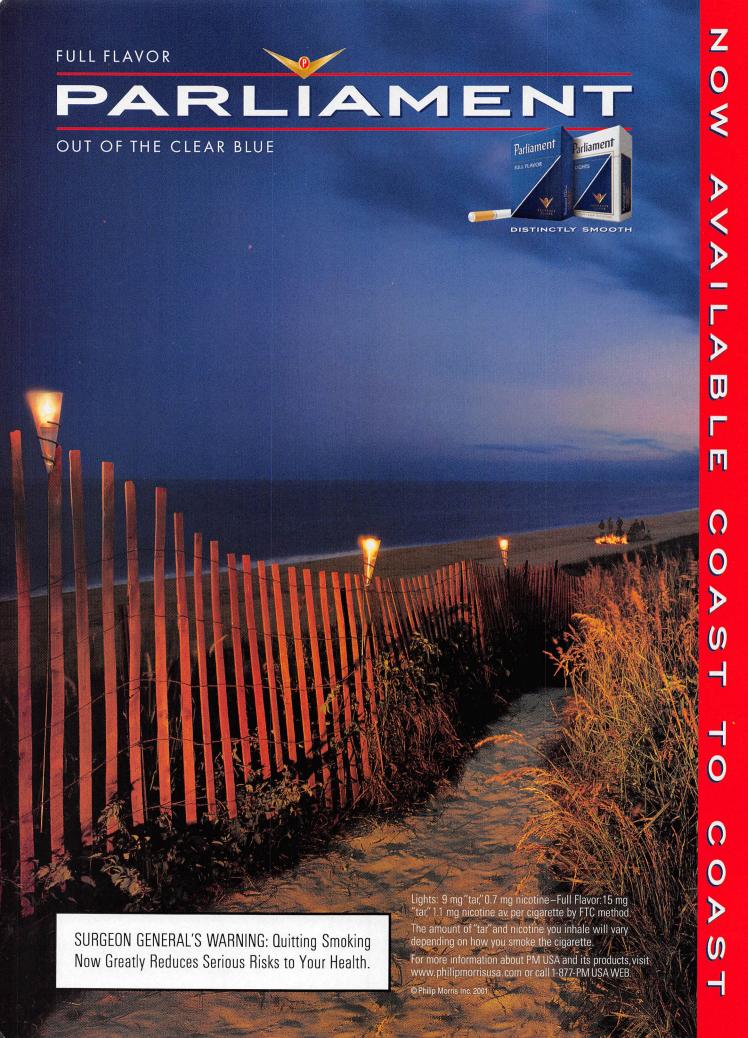
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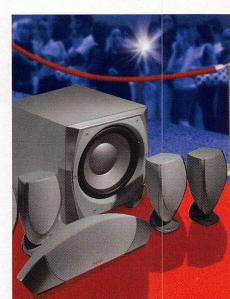
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Definitive's Revolutionary New PowerMonitors

With Built-In Powered Subwoofers for a Dramatic Breakthrough in Bookshelf Loudspeaker Performance

"Showstoppers!" -Sound & Vision

Definitive was the first to build powered subwoofers into tower speakers and the result changed loudspeakers forever. Now we're performing the same magic for bookshelf speakers and they too will never be the same.

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When we introduced our new PowerMonitors the press went wild! Experts raved that with their superb imaging, breathtaking clarity and awesome bass, the PowerMonitors dramatically outperform all other bookshelf speakers regardless of size or price. And these compact, custom installable, ultra high-performance music and home theater speakers are easily placed in cabinets, on stands or on shelves.

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SOUNDVISION

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randomplay

EDITED BY BRIAN C. FENTON

Satellite Radio Is Just About Here

"Radio Reborn" in the June issue suggested what we could expect when the XM Satellite and Sirius Satellite services went live this summer. Although Sirius has had its three satellites in orbit for several months, it had to postpone its launch because of delays with its receiver chip sets and now expects to be on the air by the end of the year. XM's two satellites - named Rock and Roll — are also in orbit, and at press time XM was on target for a mid-September launch. Aftermarket hardware for both services is in stores now.

Since our last report, a subscription to Sirius has gotten a little more expensive, going from \$9.95 a month to \$12.95 a month, while XM raised its price 4¢ to \$9.99 a month. Both still plan to offer 100 channels

— 50 for music and 50 for sports, news, weather, etc. Sirius justifies the price differential by its promise to keep the music channels free of commercials, while XM promises no more than 5 minutes of commercials per hour on its own music channels.

On the new-car scene. the 2001 Cadillac DeVille and Seville already sport XM-ready radios. XM's automaker partners, including GM, Honda, and Toyota, expect more XM radios to be available in their 2002 model cars, with a broadscale rollout planned for the 2003 model year. The situation is similar for Sirius, whose receivers will be showing up first in select Ford, DaimlerChrysler, and BMW vehicles.

Which service vou'll be able to receive, however, depends on the radio and decoder you buy. The Alpine and Pioneer models, like Sony's plug-andplay transportable receiver, are compatible only with XM signals, while Kenwood's and Panasonic's car radios receive only Sirius signals. Radios that accept signals from both services aren't expected to be available until 2004.

If you want satellite service but don't want to replace your current car radio, there's a variety of FM modulator kits to choose from. These kits, which include a satellite tuner with channel display and an antenna, feed a signal to an unused frequency on your existing radio.

You can sign up for either service at select retailers or online at xmradio.com or siriusradio.com.

— Jamie Sorcher

place your current car radio with one that can pick up the XM or Sirius satellite service, you'll find more than 40 "satellite-ready," three-band radios available at major electronics stores for \$250 and up. With these aftermarket radios, you'll need a compatible outboard satellite decoder module and a small roof- or windowmountable antenna to receive signals from the satellites and ground-based repeaters (which help spread the signals around in cities and other difficult reception areas).

If you

want to re-



The Godfather DVD Collection

Paramount \$100

On October 9, Paramount will give fans an opportunity they probably won't refuse to reassess the whole of Francis Ford Coppola's saga (including the underappreciated *The Godfather Part III*) with a five-disc boxed set, *The Godfather DVD Collection*. (The films are not yet being reissued

on DVD separately.) The Godfather (1972) and The Godfather Part III (1980) each get a disc, while the 200-minute The Godfather Part II (1974) is spread over two more discs. Each film is accompanied

by a director's commentary, and the fifth disc

is given over to a lush selection of bonus materials, including:

- a 73-minute documentary on the films' origins, including screen tests and rehearsals;
- an inside look at Coppola and the creative process following the *The Godfather* from book to screen;
- a tour of locations on New York City's Lower East Side;
- two behind-the-scenes mini-documentaries;
- additional scenes added for the 1977 TV release (*The Godfather Saga*) presented within a timeline from 1898 forward that puts the rise of the Corleone family into the context of real-life events;
- featurettes on Gordon Willis's cinematography, Nino Rota and Carmine Coppola's music, and how the director and the novelist, Mario Puzo, collaborated in the original screen adaptation.

All that plus storyboards, a Corleone family tree, character, cast, and filmmaker biographies, Academy Award acceptance speeches, photo galleries, and trailers promise to make this a set with a lotta bang-bang for the buck.

Josef Krebs

Prime Time DVD

During an episode of NBC's Frasier last season, Niles buys a DVD player, and there's this dialogue while the Crane brothers are in the checkout line: Niles: What do you suppose

multi-angle capability means? Frasier: Well, it means the remote control will respond from any angle.

Attractive woman: Not to intrude, but actually it means you see a scene from different camera angles.

Frasier: I was just teasing him. You see, my brother is technologically challenged. Niles: You know, if anyone's technologically challenged, it's vou!

Frasier (to woman): He's a bit defensive.

Niles: You thought the CD-ROM tray was a cup holder.

High-Def Soap

While the other networks seem unenthusiastic about high-definition TV (HDTV), CBS is not only airing most of its primetime schedule in high-def but has also brought it to daytime TV. Since June, the Emmywinning The Young and the Restless has been the only daytime show produced and broadcast in HDTV. But how did the new medium's supersharp, unforgiving pictures go over with the soap's stars, whose livelihood hangs on their perfect complexions and not-a-hair-out-of-place looks?

The cast "was concerned you'd see every pimple," laughs executive producer Ed Scott, but the whole transition has played out without a hitch. "We thought camera positions would be more critical," he



15 Minutes with Ted Nugent

Never let it be said that Ted Nugent could be caught at a loss for words. Nugent, 52, the self-described "French tickler of truth," recently spent a few days in New York City going gonzo on radio talk shows dissecting his new live album, Full Bluntal Nugity (Spitfire). During

the ensuing mayhem, the Motor City Madman kindly blocked out some time for us before heading off to perform at Jones Beach Amphitheater in Wantagh, New York. His goal for that gig? "To scare all of the white people on Long Island." - Mike Mettler

You've released a number of live albums in your career. What is it about the live environment that appeals to you?

Well, certainly that's where the rock & roll beast is in its primal scream. It's a social campfire, is it not? It's the consummate reciprocal snowball from hell. Playing live is an out-of-body/out-of-spirit experience that has no parallels I can think of. This live album ultimately represents the celebration of our musical dedication and the equal amount of musical crave. We don't just like playing, we don't just enjoy playing - we f--king crave it. You've gotta see us before we go onstage. We're like wolves that just saw a hamstrung moose in a snowdrift - all growling and guttural noises.

You're not a big fan of Napster.

Oh, no. [sarcastically] I'm a big fan of thievery. Anybody who can pilfer and vandalize and shoplift — I'm a big fan of all of that. My thing is, if you've got a product in your right hand, do you have a receipt for it in your left hand? And if you don't, you stole it.

The example I use is, if you go to a restaurant, have a great meal, and then leave without paying for it, what's the difference between that and downloading copyright-

ed music for free?

Hello! And if the restaurant wants to give it to you, that's the individual restaurateur's decision, not the restaurant industry's.

What do you think of satellite radio?

Isn't it wild? God knows I need it, because I live way out there [in rural Michigan]. and I can't get the stations I'd like to. I have an offer to do a satellite show, which I'll probably get to in 2003. Watch what I do.

You know who's out of

touch? I'll tell you who: the networks and major radio [programmers]. When my satellite show starts, I'm going to eat their drawers. The box they're trying to get out of? Think of Hiroshima. That envelope they think they're pushing? Think of Nagasaki. There'll be nothing taller than your toehair when I get through with 'em. You'll love it. I'll play my guitar live, have meaningful guests, and talk about real qualityof-life issues with a chutzpah surpassed only by Richard Pryor on fire.

Knowing how much you dislike pianists, I have one last question for you: How many keyboard players does it take to screw in a light bulb?

Probably all of them! Seriously, I think keyboards are great - if you're in church and somebody died. [laughs]

noted, "but that's not the case. HDTV is more flexible than film but can look as good."

CD Rot Redux

Remember the "CD-rot" scare of the late 1980s? Here's one for the new millennium: a microscopic fungus that eats compact discs. A Spanish scientist was visiting Belize, where friends showed him CDs that had stopped playing. After returning to Spain, he discovered that the cause was a fungus that ate through not only the polycarbonate outer edge but also the aluminum

data layer. Although the fungus is widespread, scientists say music lovers in most parts of the world needn't worry as it will attack CDs only under exceptionally hot, humid conditions.

TiVo Plays Hardball

The latest software for TiVo boxes (Version 2.0) limits their functionality for users who don't subscribe to the TiVo service. One-touch recording has been disabled, meaning you can't hit the record button during a show to save it to the internal hard drive - you have

to program the date and time manually. The "Now Playing" list shows only the dates when shows were recorded, not the times. The one added feature? When you're scrolling between channels, you get messages urging you to subscribe.

Big Drives

Compaq, Microsoft, and others have expressed support for the proposed Big Drive standard, which would increase the current 137-gigabyte maximum hard-drive capacity to 144 petabytes, or more than 100,000 times as much.

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SACD vs. DVD-Audio

After reading the Super Audio CD articles and music reviews in your July/August issue, it occurred to me that Sony is making some potentially fatal mistakes. SACD is a very elegant format that delivers amazing sound. But so does DVD-Audio. Here's what I think it would take for SACD to survive:

First, other major record companies have to get behind it. Sony Music is the only biggie releasing any SACD software. DVD-Audio is in the same boat, with Warner Music the only major releasing titles in that format. More big labels need to make up their minds and get some titles on the market.

Second, all SACD discs must be hybrid playable, if not with full resolution, in all CD and DVD players, just as DVD-Audio discs are playable in any DVD player. That would also make retailers' jobs much easier (they wouldn't have to support double or triple inventories). The real question is not which format will survive, but which manufacturer will be the first to market an affordable "universal" high-resolution player that would enable consumers to make their own comparisons?

Finally, SACD prices must be more realistic. They shouldn't cost more than regular CDs, which are overpriced already. Jay Rudko Pembroke Pines, FL

Your recent articles on the new high-resolution multichannel formats have really started to irritate me. As a home theater enthusiast for the past seven years, I feel I've earned the right to let the industry honchos know they're losing my support.

The war between DVD-Audio and SACD has caused me to back off from considering either format. I'd rather spend my money on digital photography and computer gear. There isn't enough software available to even bother thinking about purchasing a player for either format. It's time for the home-entertainment industry to wise up, get its collective act together, and agree on formats that make sense.

> **Jeff Lenow** Medford, NJ

I recently visited the local Tower Records to check out what was available on Super Audio CD and DVD-Audio. Fortunately, the discs were easy to find since they were all grouped together in the Jazz department! The titles certainly brought back memories - memories of early 1984, that is, when I bought my first CD player and went looking for discs.

The SACD selection was the more comical, with some of the same titles that awaited early adopters of CD in '84 — Toto, Boston, three Billy Joel albums, and, of course, Weather Report. (Why'd they leave out Men at Work?) Okay, there was Bob Dylan's Blonde on Blonde, but we're talkin' the Columbia/ Sony catalog here, folks. And all of these titles were two-channel only. The classical and jazz selections were somewhat better, but this is the label that has the entire Leonard Bernstein/New York Philharmonic catalog, along with the Byrds, the Clash, Elvis Costello, Bruce Springsteen, Janis Joplin, Indigo Girls, and Mary-Chapin Carpenter. We're supposed to buy a new player to hear Toto?

> **Raymond McKee** San Mateo, CA

As a symphony orchestra enthusiast, I have been aware from Day 1 of what some call the cold, metallic, sterile sound of many CDs. However, upon closer examination, it became clear that digital technology only removed the veil covering LP recordings and presented the recorded sound as it really was. In orchestral music, the sound of massed strings is hardest to capture, and shortcomings here were the main basis for criticisms of "CD sound."

Without going into the many, many possible causes, we have to accept that if there is even one perfect-sounding CD, then "CD sound" cannot be the fault of the medium but of the recordings themselves. And I have personally heard not just one but a number of CDs where everything fell into place for a perfectly faithful reproduction. That's why I think the new "super" formats will have a hard time taking hold. Many problems will have to be solved, at least in symphonic recordings, before there is more than a minute difference between the new and old technologies. Their best hope is the surround sound feature, which could possibly make the difference. Still, let's not forget that with badly made recordings, the more clearly we hear them, the worse they sound. Ernest Winter Bethesda, MD

3:2 Pulldown

In your reviews of DVD players and HDTVs, you say if they're capable of 3:2 pulldown. But there are also outboard devices that can do this. Is it better for 3:2 pulldown to be done in the DVD player or the monitor? And how important will 3:2 pulldown be on a monitor without progressive-scan capabilities?

> **Patrick Wahlquist** Las Vegas, NV

First a word on nomenclature — 2:3 is a more accurate way to describe the process than 3:2,



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of advice: don't!



feedback

though both terms are commonly used. Although some are on the way, very few HDTV monitors that have been released so far include a built-in line doubler with 2:3 pulldown, which is a feature that improves the look of film-based interlaced video sources when they're upconverted to a progressive-scan display format. (Since 2:3 pulldown is applicable only to interlaced signals that get upconverted for progressive-scan display, TVs lacking progressive-scan capability don't include the feature.) The key advantage to having a TV or an external processor, rather than a DVD player, perform line doubling with 2:3 pulldown is that it can help improve the look of other video sources besides DVD, such as satellite or cable TV.

Live Sound

In June "Feedback," reader Courtney Guillen says that the sound of a live performance not only comes from the stage but is also reflected from many different surfaces. While this may be true, the music is still originating from an area more or less within the stereo soundstage. Yes, the walls contribute to what you're hearing, but so do the walls in your home. A stereo speaker arrangement simulates the musicians on stage as the source, and your walls then add the ambience. Is it really better to create canned ambience and then pan it to the surround channels? When you play it back at home, you'll be adding ambience to ambience! **Rob Fulkerson**

David Ranada replies: As with comedy, the secret of ambience reproduction is . . . timing. Your living room probably does produce lots of reflections. And if it were shaped like Carnegie Hall, they'd come from substantially the same directions as in that august structure. But they'd also arrive at your ears far too loud and - even more important - far too early compared with the long reflection delays created by a large enclosed space.

Provo, UT

Human ears are extremely good at discerning such differences in timing, which is why plain stereo can never sound totally realistic when reproducing acoustic music. A good multichannel recording that is intended to sound like a live performance — not all are — will incorporate the long reflection delays into the signals. And the delays will be the original ones of the performance space, not artificially created simulations as in ambience enhancement.

HBO-HD

After many months of research, I've bought a high-definition decoder for my HDTV-ready set. How can I find out what programs HBO is sending out in high-def? The Web site for the cable company that supplies the HDTV

signal gives me local broadcasts but not the HBO lineup. Jason Maguire

Ridgefield Park, NJ

You can find out what's showing on HBO's East and West high-def channels by going to hbo.com and clicking "Full Schedule." Once you've accessed the schedule page, clicking "Customize" will allow you to configure the program listings to include HBO's high-def offerings.

Remote Feedback

My remote controls give me zero feedback as to what radio station I've got tuned in, which CD is playing in my changer, or what track I've selected. To find any of this out, I have to sit right in front of the equipment. We need remotes that'll give us all the information that's on the front panels. **Robert Hall**

Grass Valley, CA

We'd like that, too, but it's not simple to implement. Your remote would need an LCD readout (which could make it bigger and heavier), and the equipment would need some way of "talking back" to the remote. And if the remote controls several components, they'd all have to be the same brand or follow the same control and communication protocols. At present, we know of few remotes with this feature. The Kenwood VR-5900 receiver (reviewed on page 56) has one of them.

Why Not FireWire?

The consumer-electronics industry should make more of an effort to embrace and promote the FireWire standard. It would provide welcome relief from the tangle of cables a lot of us have with our home entertainment systems. I've noticed that some super high-end gear is starting to use FireWire connectors, but more affordably priced gear should have them too. What is holding up the adoption? Is this yet another chicken-and-egg problem?

Bob Aldridge via e-mail

Mr. Aldridge, have you spoken with Mr. Hall? Universal adoption of the FireWire (a.k.a. IEEE 1394 or i.Link) standard for connecting A/V equipment could give us smart remotes that can tell what the equipment they control is actually doing. But it won't happen soon because the technology is orders of magnitude more complicated than conventional A/V interconnects. Implementing FireWire connections takes a lot more engineering smarts than even conventional digital audio connections require. So far the only home A/V equipment where FireWire has seen much use is digital camcorders.

Vinyl: Dead or Alive?

Ken Pohlmann hits a trendy South Beach disco, and what are the kids dancing to? Vinyl!

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- Roger Kanno, SoundStage!

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feedback

Dejected, he goes home to watch some tube. What's on? The Mercedes-Benz "Noah's Ark" ad. What's worth saving? A pair of Benzes, an iMac, and — a stack of *vinyl!* Outraged, he decides to surf the Net or eBay. What? Hundred-dollar bidding frenzies for used, "wornout" *vinyl!*

Sickened, Pohlmann grabs some of his beloved CDs and goes for a ride. Finding himself on 163rd St. in North Miami Beach, he

spies Blue Note Records. Ah! A store full of CDs! But wait? Why are all those kids crowding that other room? Oh no! It's full of viny!! New viny!! Springsteen Live in New York City on three LPs (cut from the 88.2-kHz/24-bit master!) from . . . Sony? Hip new alternative rock on Matador, Sub-Pop, Thrill Jockey, Drag City, and other trend-setting labels. Beck? Eminem? Phish? Robyn Hitchcock, Prince, Beastie Boys, Pavement, Richard

Thompson? Ramones, Dylan, Otis Redding? Miles Davis's entire Sony catalog? Yo La Tengo? Luna? The entire Led Zep and Hendrix catalogs on . . . vinyl? "Don't these kids read my column? They don't make vinyl anymore. It wears out. It's *analog*. Feh!"

Pohlmann wakes up. Whew! It's a fantasy. Well, his knowledge of this subject is anyway. It's all true, though. But how could Ken know any of this? After all, when I debated him on the CBS Radio network a few years ago, he made the stunning admission that he "skipped over" the LP era. It's still here, Ken, and my 30-year-old "worn-out" rock and jazz LPs still sound better than the fourth or fifth CD remasterings of your old favorites.

Michael Fremer senior contributing editor, Stereophile via e-mail

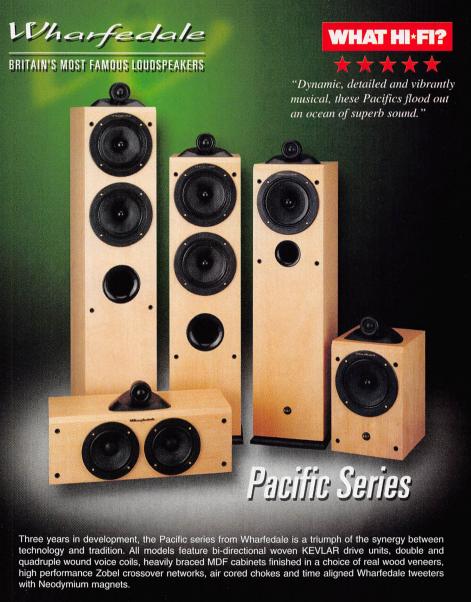
Ken Pohlmann responds: Good to hear from you again, Mike. Your demonizations of me and digital audio are always so witty (but repetitive, as though stuck in a vinyl groove). In your fantasy, sales of LPs are strong and soaring (perhaps fueled by the explosive energy of countless clicks and pops). Sorry to burst your bubble, but in reality vinyl sales have been dismal for a decade, and according to the Recording Industry Association of America, last year (the most recent figures available) they dropped by 24.6%. While 87% of the music discs sold were CDs, unit sales of LPs, EPs, and vinyl singles amounted to only 0.6%. Figures for sales of Edison cylinders were unavailable. Anyway, best of luck with the zealotry thing, and above all, have fun beating your dead horse.

Corrections

The test report on the Energy Take 5.2 home theater speaker system in June included some errors. The \$900 package price includes two pairs of Take 2.2 satellites, one Take 1.2 center speaker, and one Take 8.2 subwoofer. The Take 2.2 can be bought separately at \$220 a pair, and the Take 1.2 is available for \$160 each. The optional stands are called Take 2.2 (not 5.2).

Konka has changed its plans since May's "DVD for All" survey, and the DK-3100V and KD-2800V players, which were listed as "available May 2001," will not be in stores until late this year.

We welcome your letters. Send e-mail to soundandvision@hfmmag.com and regular mail to Editor, Sound & Vision, 1633 Broadway, New York, NY 10019. Please include your name, street address, and phone number for verification; only your name, city, and state/country will be printed. All letters are subject to editing at our discretion.

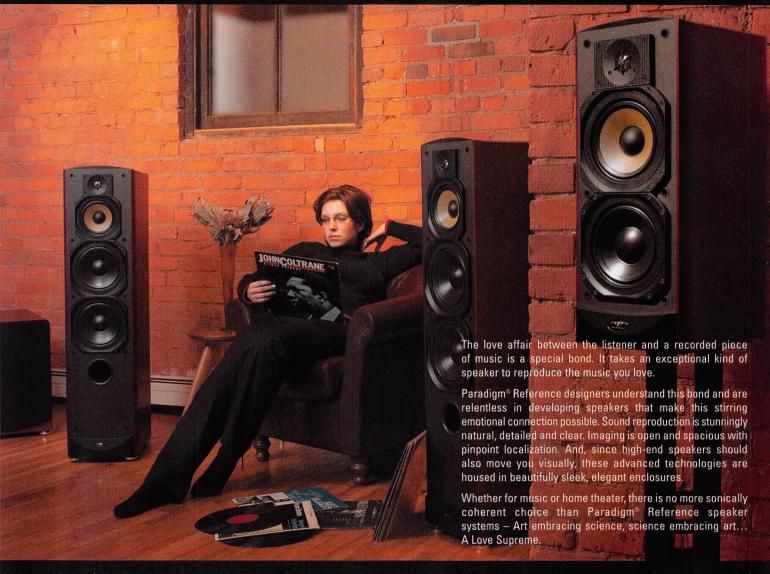


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-Robert Deutsch, Stereophile, Vol. 23 No.6, on the Studio/100



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Sony

Pushing the upper size limits of a cathode-ray tube (CRT), Sony's 40-inch KV-40XBR700 Wega is the largest direct-view CRT set on the market. It's also an HDTV monitor and has two wideband component-video inputs, 2:3 (also called 3:2) pulldown capability to improve the look of film-based material, and aspect ratio control. You can even watch a standard program inset into a high-def one, or vice versa. The mammoth Wega, with optional stand, is slated to reach stores in October. Price: \$3,500. 800-222-7669, www.sel.sony.com





Klipsch

Taking command of Klipsch's floor-standing speaker line is the new Reference Series flagship, the RF-7. The two-way model has a 13/4-inch titanium-dome tweeter incorporated into an 8-inch-square Tractrix horn plus two 10-inch ceramic-coated aluminum woofers. Frequency response is rated as 32 Hz to 20 kHz ±3 dB. The 115/8 x 45 x 16-inch, magnetically shielded wood enclosure is available in black, maple, and cherry finishes. Removable cloth grilles are provided. Price: \$2,200 a pair. 800-554-7724, www.klipsch.com

Blaupunkt

If your passengers need something new to do on those long road trips, consider Blaupunkt's DVD-ME1 car player. In addition to regular DVDs and CDs, it can play recordable CDs with MP3 files. A memory buffer (10 seconds for DVDs) and a spring-suspended mechanism help minimize interruptions on even the roughest of roads. The $63/4 \times 3 \times 81/2$ -inch player is designed to fit nicely under a seat or in a glove box — an external wired remote sensor and a full-function infrared remote are included. Also supplied is an AC power adapter so you can use the DVD-ME1 in your home system. Price: \$450. 800-950-2528, www.blaupunktusa.com



amaha

The DVD-S1200, Yamaha's flagship player, is very accommodating: DVD-Video and DVD-Audio discs, CDs, and recordable CD-Rs and CD-RWs are all welcome. A progressive-scan output with 2:3 (also called 3:2) pulldown (to compensate for film-to-video frame-rate differences) delivers the best possible images on progressive-scan monitors. The player has built-in Dolby Digital and DTS decoding as well as virtual surround sound for two-speaker or headphone playback. In addition to a component-video output switchable between interlaced and progressive-scan, there are two composite- and two S-video outputs, coaxial and optical digital audio outputs, and a six-channel analog output. Price \$999. 800-492-6242, www.yamaha.com



Lexicon

The flagship digital system controller/processors from Lexicon, the MC-12 and MC-12 Balanced, are both 12-channel models with outputs for three independent zones: Main, Zone 2, and Record. They provide decoding for Dolby Digital and DTS 5.1and 6.1-channel soundtracks, plus Dolby Pro Logic II and Lexicon's own Logic 7 for multichannel playback of stereo programs. There are discrete linelevel outputs for left and right subwoofers and two back surrounds as well as the five main channels. An RS-232 port and three expansion slots aim to make them future-proof. The MC-12 Balanced uses multipin XLR connectors for its Main and Zone 2 outputs. Prices: MC-12, \$8,995; MC-12 Balanced, \$9,995. 781-280-0300, www.lexicon.com

Aiwa

With its soft curves, simple design, and glowing speakers, Aiwa's XR-M313 minisystem has got a look that speaks volumes. The speakers' translucent-purple cabinets light up whenever the CD player or AM/FM tuner is turned on. The tuner has 32 presets, and the built-in graphic equalizer has three factory-set tone-control settings. CD tracks and tuned frequencies are shown on a backlit color LCD. A full-function remote control is supplied. Price: \$180. 800-289-2492, www.aiwa.com



NOTE All prices and product information are supplied by the manufacturers. Dealer prices may vary.



Polk Audio

The DS7200 Digital Solution from Polk Audio is a home theater in a hefty box large enough to hold a DVD-Video player (not shown), a tuner/preamp, four identical satellite speakers, a center speaker, an 8-inch subwoofer that contains the six-channel system amplifier (total of 350 watts), a full-function universal learning remote control, and all necessary cables. The tuner/preamp includes Dolby Digital and DTS processing and has three digital audio inputs, five composite/ S-video inputs, and a six-channel analog input — with bass management! — for a DVD-Audio or SACD player. A proprietary six-channel music processing mode provides surround sound from stereo sources. Rated frequency response is 30 Hz to 20 kHz ±3 dB. Price: \$2,599. 800-377-7655, www.polkaudio.com

Aperion Audio

Thinking inside the box of the SW-8PR subwoofer from Aperion Audio (formerly EdgeAudio), there's an 8inch driver powered by a 150-watt amplifier and supplemented by two 8-inch passive radiators. Thinking outside the box, the sub's rated frequency response is 35 Hz to 180 Hz ±3 dB. Thinking of the box itself, it's made of high-density fiberboard with a cherry hardwood exterior, measures 121/4 x 13 x 12 1/2 inches, and weighs 271/2 pounds. The sub also has a variable crossover, a phase switch, and a detachable power cord. Price: \$387. 888-880-8992, www.aperionaudio.com



Contoured Edge

A freshly played CD's default storage position between player and jewel box is generally the nearest horizontal surface. Unfortunately, this intermediary placement exposes the disc to potential smudges, scratches, and predators, like housecats. You can give your discs a proper rest with Contoured Edge's Third Hand CD Hold Buttons. Each self-adhesive plastic knob ensures that the disc's playing side touches nothing but air. They work for DVDs, too, and are available in five colors. Price: \$4.95 for a three-pack. 541-434-5727, www.cdhold.com



Russound **Technologies**

Become the master of your A/V domain with Russound Technologies' CP 4.6 multiroom preamplifier. It provides preamp-level outputs to four zones for up to six sources. All can be controlled via its full-function front panel or by keypads mounted in each zone. An intercom function allows for paging through all zones, and an RS-232 port allows the CP 4.6 to control up to as

many as 16 zones. Price: \$3,600. 603-659-5170, www.russound.com



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new products



Pinnacle

It's easy to match the timbre of all five main speakers in your home theater with Pinnacle's versatile Quantum. The two-way, acoustic-suspension speaker has a cabinet made of die-cast aluminum to reduce resonances, and the drivers are magnetically shielded. Two 3-inch graphite woofers flank a 1-inch titanium-dome tweeter with a vapor-deposited purple hue. Frequency response is rated as 100 Hz to 21 kHz ± 3 dB, sensitivity as 86 dB. Dimensions are 3% x 9% x 7% inches, weight 5 pounds. Each Quantum comes with a pivoting base (shown); taller stands are optional. Price: \$599 a pair, \$899 for three, \$1,499 for five; stands, \$249 a pair. 800-346-2863, www.pinnaclespeakers.com



It may be only 4 inches thick, but the Runco PlasmaWall PL-42cx HDTV monitor is said to deliver the deepest of blacks. It can accept 480p, 720p, and 1080i digital TV formats from an outboard tuner and can also handle computer resolutions up to 1,600 x 1,200 pixels (UXGA). The 42-inch widescreen set comes with Runco's outboard Virtual High Definition controller, which scales all incoming signals to the panel's native resolution, 854 x 480 pixels. Now wipe that drool off your shirt. Price: \$15,995. 800-237-8626, www.runco.com

Samsung

Given the expanding world of high-definition TV (HDTV), it's a good idea to keep your options open, and Samsung's SIR-T150 set-top HDTV tuner can help. Once it picks up a signal, the tuner can output it in any of the four common digital TV formats, 480i and 1080i (interlaced) or 480p and 720p (progressive). Connect your HDTV monitor to either the wideband component-video or VGA output, and select the desired format on the back of the tuner. The SIR-T150 also features aspect ratio control and has an antenna signal-strength meter. A universal remote control is supplied.

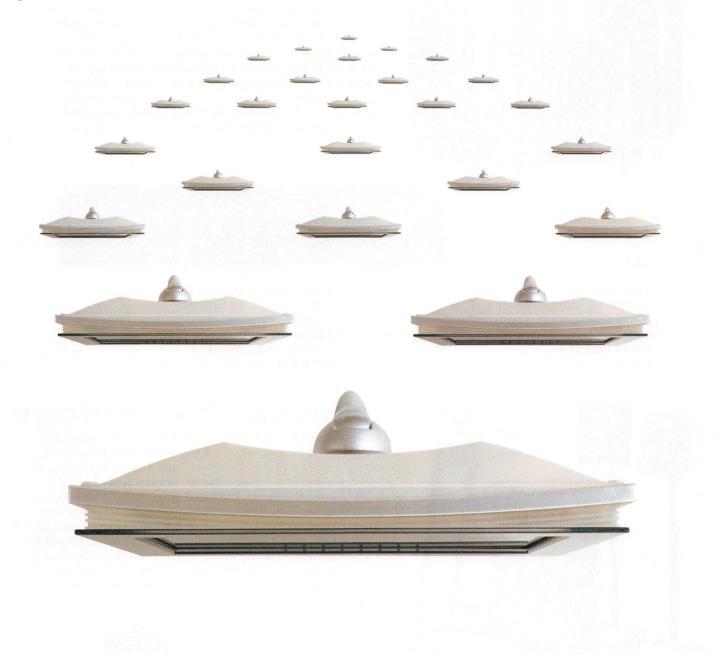
Price: \$699. 800-726-7864, www.samsungusa.com

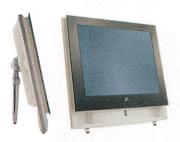


Ambiance Acoustics

Get your home theater squared away with the Ambiance Acoustics HY-V (pronounced "high-five," apparently) speaker system. Five 135%-inch Hyper Cubes and three two-channel processors constitute the hive, with each cube sporting four 4½-inch drivers on each of four sides — for a system total of 80 drivers! Frequency response is rated as 45 Hz to 16.5 kHz –5 dB. Reflections from room walls are said to create a sense of spaciousness, though your home theater will look as if it's been assimilated by a Borg armada from *Star Trek*. Price: \$5,817. 858-485-7514, www.ambianceacoustics.com







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Tannov

Designed to meet the demands of 21st-century audio systems, Tannoy's trapezoidal Dimension speakers will stand out in your home theater. The three floor-standing models use concentric woofers and midrange drivers along with Tannoy's 1-inch SuperTweeter. The paper-cone woofers vary in size, with the largest (12 inches) taking bass frequencies down to 30 Hz. Biwirable terminals with gold-plated connectors and birchwood cabinets further emphasize the elegance of higher Dimensions. Prices: floor-standing, \$6,000 to \$10,000 a pair; center, \$4,000; subwoofer, \$7,000. 519-745-1158, www.tannoy.com



NAD

To get the most out of the airwaves, a radio junkie's best bet is a separate stereo tuner like NAD's C420. Using functions like RDS (Radio Data System) and Radio Text, the tuner can display the call letters or name of the current FM station along with information like the DJ's name and the music currently playing. AM and non-RDS stations can be assigned eight-character names. The 171/8 x 33/4 x 111/4-inch tuner has 30 station presets, and its frequency response is rated as 15 Hz to 15 kHz ±1.5 dB. Price: \$240. 781-784-8586, www.nadelectronics.com



Atlantic Technology

The speakers in Atlantic Technology's T 90 home theater system are designed to be unobtrusive, with the T 90 LR front left/right speakers measuring only 63/4 x 101/2 x 75/8 inches. These and the slightly smaller T 90 SR surrounds have 51/4-inch graphite woofers, while the T 90 C center has two 4-inch woofers. The C and the LR have 1-inch tweeters. and the SR has two ³/₄-inchers firing out of phase from opposite sides. The tilting center speaker has a high-frequency level control to ensure tonal balance with its front partners. Threaded inserts on the LR and SR speakers enable wall mounting; the metal stands shown are optional at extra cost. The 43-pound T 90 PBM subwoofer, with its 12-inch longthrow cone, is rated down to 25 Hz ±3 dB. System price: \$1,699. 781-762-6300, www.atlantictechnology.com

Sennheiser

Sick of being tethered to your stereo system when using headphones? Wireless RF headphones like Sennheiser's RS 65 will let you run free. You can be enveloped by sound without disturbing anyone else thanks to SRS virtual surround sound processing, and a built-in audio filter protects against TV interference. The auto-tuning headphones operate in the 434-, 863- and 925-MHz RF bands. The transmitter base also acts as a charger cradle; one charge is said to last up to 4 hours. Price: \$210. 860-434-9190, www.sennheiserusa.com







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How Progressive Is It?

Q. Will any progressive-scan DVD player hooked up to any rear-projection HDTV or HDTV monitor allow me to view a movie in the 720p format, which I assume gives about the best possible picture? What is the highest resolution I can expect to obtain?

Mark Berard Fairview, TX

A. You can connect a progressive-scan DVD player to any high-definition television (HDTV) or HDTV monitor, and you'll probably get an outstanding picture, but it won't be "true" high-definition. For now, the maximum vertical resolution of DVD, like all video based on the NTSC standard, is strictly 480 lines, meaning that there

on everything theater, audio,



are 480 active horizon-Expert advice tal scan lines, counted from top to bottom of a frame. (Yes, we know about home it's confusing! Horizontal resolution is measured using test patterns and video. with closely spaced vertical lines, and DVD's theoretical maximum value is 540.)

Standard DVD players output 480-line video frames in the interlaced format, or 480i.

while a player with a progressive-scan output can "line double" those same images to the 480p format, which has higher apparent vertical resolution. But you don't actually see twice as many lines per frame you just see the same lines presented faster and in sequential order rather than oddnumbered lines first and then even-numbered lines. So 480-line vertical resolution is the best you're going to get from any DVD-Video player. A few displays, such as HDTV-grade plasma sets and DLP (digital light processing) projectors, can "upconvert" 480i or 480p signals to 720p resolution, but this process often introduces image-degrading artifacts.

Remote Speakers

Q. I intend to buy an all-new speaker system for my home theater and use the B switch on my receiver to drive my existing stereo speakers in another room. Most like-

ly I will use either the A or B switch, but not both at the same time. It's not practical to use another amplifier for the old speakers, but I'm worried about the 60- to 70foot cable run from my home theater to the room with the stereo speakers. Can I use ordinary 14- or 16-gauge cables for this long run, or do you recommend special cables?

Hilla Sadri

San Clemente, CA

A. There's no reason you can't set things up as you've described. You are right not to run both speaker systems at the same time for a couple of reasons. One is the usual problem of lowered impedance when you run speakers in parallel, which can cause amplifier problems. The other is that if your receiver is in surround mode, the remote speakers would get only the signals fed to the front left and right speakers in your home theater array, which could be distinctly weird to listen to. For this reason, remember to switch the receiver to twochannel mode when feeding the remote speakers.

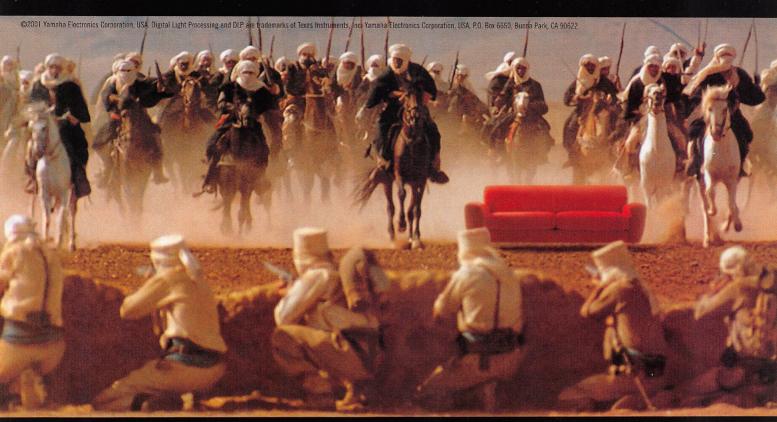
As for the long cable run, it shouldn't be a problem if you use a low enough gauge (meaning thicker cable). For the lengths you described, 12-gauge should be considered the minimum; 10-gauge would not be overkill. You can use specialty speaker cables if you want — they're invariably thick enough — but you don't need to.

True Quad?

Q. Inspired by your July/August review of the Super Audio CD reissue of Mike Oldfield's Tubular Bells, taken from a quadraphonic master, I picked up a vinyl copy of the quad LP. I've been setting my receiver to decode the signal with Dolby Pro Logic. The sound does come out in four channels (counting my two surround speakers as a single channel), but am I getting the same separation that was intended, a variation of it, or something totally different?

Vance Philip Hedderel Arlington, VA

A. Something totally different. The quadraphonic version of Tubular Bells was issued in JVC's CD-4 format, in which each wall of the LP groove contained a mix of the front and rear channels for that side, plus a high-frequency carrier that was fre-



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quency-modulated with a corresponding front-minus-rear signal. The idea was that if you played the record on a conventional two-channel system, you'd get an approximation of the regular stereo mix: left front plus rear in the left channel and right front plus rear in the right.

To get the full benefit of the quadraphonic mix, you had to add a demodulator to detect and extract the front-minus-rear signals and perform the algebraic operation needed to separate them, in the same way that left and right channels are split up in a stereo FM tuner. I suspect what you're hearing is similar but not identical to what you'd hear if you put the plain stereo version of the album through your Pro Logic decoder. In CD-4 quad LPs, the "compat-

ible" front-plus-rear signals were *never* identical to the two-channel mixes. In fact, since the rear-channel material was added to the front-channel material in phase, the separation when a quad LP was played on a two-channel system was probably *less* dramatic than in the album's original stereo recording.

Isn't DTS Enough?

• I'm pleased with my DTS system, even though the selection of DVDs has been limited. But I'm concerned about DVD-Audio. If I understand the technology correctly, DVD-Audio uses the same audio compression ratio as DVD-Video, while DTS uses a higher compression ratio. Wouldn't it make sense to continue with DTS, rather than introduce something new?

Jacksonville, FL

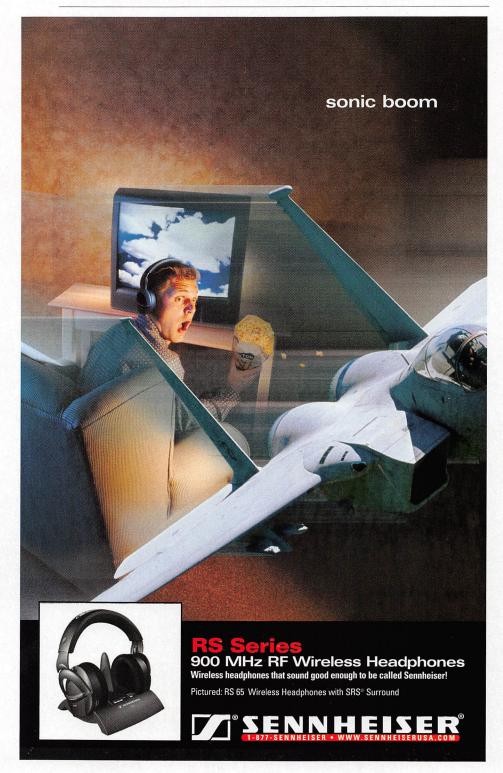
A. My main objection to the proliferation of digital audio standards is that it produces just this sort of confusion. Even though DVD-Video and DVD-Audio use the same disc technology, there is no real relation between the data-compression schemes used for each format. DVD-Video soundtracks use either Dolby Digital or the slightly less compressed DTS encoding, both of which discard inaudible material. DVD-Audio uses a much less compressed signal that can be restored completely during playback. But it takes up much more space on a disc — which is why it's not suitable for use along with lots of space-hogging video content.

Multicomponent Hookup

Q. I have a digital satellite receiver, a DVD player, and a VCR feeding my TV. The satellite receiver's RF output goes to the VCR's cable input, and the VCR sends RF to the TV. Because it does no good to route it through my VCR, my DVD player is hooked up directly to my TV's line inputs using RCA connectors. I am ready to buy a digital hard-disk video recorder (like TiVo or ReplayTV). I'd like to be able to record to my VCR from either the satellite receiver or the hard disk. What would be the most efficient way to connect all of this up?

David H. Bassett Monticello, KY

A. Ditch the RF connections. Of all the ways you can connect video components together, that's the worst. Use the line-level composite-video (RCA) feeds at the very least. S-video connections are much better, although they don't exist on most



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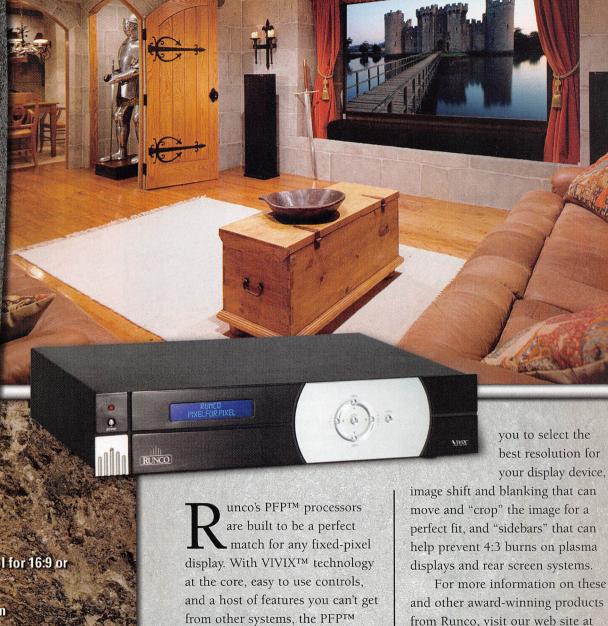
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VCRs. A component-video connection is even better for the DVD player's output, but only if your TV has a component input and is big enough for the improvement to be obvious. (See "Improving Your Image" in the May issue for more about the various kinds of video connections.)

How you configure your system depends on how many inputs you have available and what sort they are. Let me make a proposal that assumes you have a fairly typical setup that includes a VCR with two compositevideo (line) inputs and a TV with one composite- and two S-video inputs.

The VCR's composite-video inputs are fed from the composite outputs of the satellite receiver and the hard-disk recorder. The TV antenna feed goes to the VCR's RF input so you can record off the air. The VCR's composite output goes to the TV's composite input, while the TV's two S-video inputs are connected to the DVD player and the satellite receiver. You could also connect the digital recorder's compositevideo input to the composite output of the satellite receiver with a Y-adapter, unless the receiver has two S-video outputs or is an integrated receiver/recorder like the Philips DSR6000 reviewed in May.

This arrangement would let you watch satellite programs and DVDs with S-video quality and everything else in composite video. You could record videotapes off the air, from satellite, or from the hard-disk recorder. If any of your gear lacks enough inputs, a video switching unit (available at an electronics store) would help.

TV Buzz

Q. My TV radiates a buzzing noise that comes through my center speaker even when the speaker isn't connected to anything. The set also radiates some noise to the rest of my system. Would buying shielded patch cables solve this problem, or is it something bad in the set? Alex Lu

Port Edwards, WI

A. Direct-view TVs contain oscillators that move the electron beam across the screen, and the signals these produce can easily cause interference. Most set manufacturers go to considerable lengths to keep these signals inside the set, but they're not always successful. Sometimes the interference is caused by a malfunction rather than faulty design. If your problem developed recently, it's probably a malfunction and could be corrected by a service call. Moving the center speaker a few inches away from the set may help a bit, but changing to shielded interconnect ("patch") cables between components is not the answer interconnects are always shielded, and you still have the noise.

Have a question about audio, video, or home theater? Send e-mail to soundandvision@ hfmmag.com (put "Q&A" in the subject line) or regular mail to Q&A, Sound & Vision, 1633 Broadway, New York, NY 10019. Please include your name, street address, and phone number for verification; only your name, city, and state/country will be printed. Sorry, but only questions chosen for publication can be answered, and all letters are subject to editing at our discretion.



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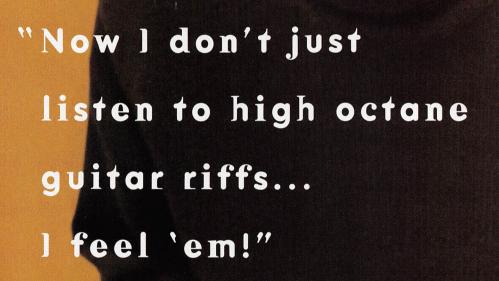
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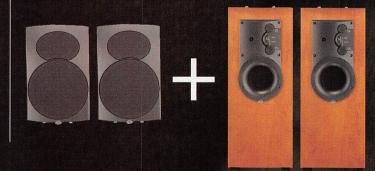




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home theater DAVID RANADA



Digits Triumphant

he annual convention of the National Association of Broadcasters (NAB) doesn't often generate a notable quote. Then again, last April's conclave in Las Vegas was the occasion for a notable event — the surprise appearance of the legendarily reclusive filmmaker George Lucas at a Sony press conference. Talking about his recent use of high-definition video equipment to shoot parts of Star Wars: Episode I — The Phantom Menace as well as all of the upcoming Episode II, Lucas remarked - in front of me and hundreds of other reporters and Sony person-

renunciation of film quoted - "I will never,is a milestone in on film." the advance of the rear-quard



nel, which helped en-George Lucas's sure that he'd be widely ever make another film,

While I had already known that Lucas was digital media over intimately involved in the development and refinement of Sony's forces of analog. premier high-definition camcorder, the HDW-F900 (shown at right), I had no idea that he, of all people, had so completely come around to embracing digital video. Coming from a man

who learned his craft cutting and gluing together bits of celluloid — just like all of us above a certain age who've taken filmmaking courses — his statement is a milestone in the triumphant advance of digital media against the bourgeois rear-guard forces of analog systems.

Now, high-definition digital video, even HDTV, has been around longer than Hollywood's newly intense interest in the Sony camera. Cinematographers, in fact, raised considerable controversy over its 16:9 aspect ratio. What happened to persuade filmmakers of Lucas's stature to favor high-def digital? The answer reveals how traditional values can still influence the adoption of a cutting-edge technology.

What made Hollywood take notice was the HDW-F900's incorporation of a 24-

frame-per-second (fps), progressive-scan shooting mode that produces video recordings whose frame-to-frame rate corresponds to that of most film footage, which is usually shot at 24 fps. This correspondence is extremely important in film production, since it allows film- and video-derived images to be freely intercut and overlaid without costly — and picture-degrading — conversion of one frame rate to another. It also makes it easier to transfer the completed movie to other media, like DVD and videotape, even if these use different frame rates.

Ironically, the Sony camera's 24-fps/ progressive-scan mode is inferior in one important aspect to at least one of its other shooting modes: the 60-Hz/interlaced mode used in traditional camcorders, including consumer models. In interlaced scanning, the picture is always "live" instead of being "frozen" every 1/24 second. This makes for a far smoother portrayal of motion than 24-fps film can provide. Sony's product brochure cites the camera's 24-fps mode as having "the same motion footprint as footage shot on film" but doesn't point out that in such footage, medium-speed pan shots and moving objects tend to flicker or look jerky. Look for this effect the next time you watch a movie on DVD - or, better yet, in a movie theater, where it tends to be more visible.

Like top-of-the-line consumer camcorders, the HDW-F900 contains three image sensors, one for each primary video color (red, green, and blue), and each contains more than 2.2 million pixels. Since the pixel count for each sensor is approximately the same as the total pixel count of a consumer-grade digital still camera capable of producing pictures comparable to 35mm film, I could well believe Sony's claim that the HDW-F900's image quality ranks with that "of a 35mm film release print derived from a 35mm [negative]."

The Phantom Menace certainly looked that good in the digital presentation I

saw. Even with the "mild" data compression applied to the sensor data by the camcorder, the on-tape data rate is 185 megabits per second for 60-Hz/interlaced images - or 18.5 times the maximum data rate of the DVD format. Now that's picture quality. The camera uses a digital videocassette the same size as Sony's old Betamax tapes (you remember Beta? — the System That Would Not Die).

One of the few areas where consumer camcorders score over their professional brethren is what you get besides the basic picture-taking electronics. For example, I know of no consumer-grade camcorder that doesn't come with a lens. The Sony HDW-F900 is supplied not only sans lens, but also sans battery, sans battery charger, and sans power adaptor. Nor do you get such consumer niceties as autofocusing or compensation for handheld camera shaking. Professional cinematographers would look askance at such presumptuous mechanization.

Another area where consumer camcorders have it all over professional models is price. The cost of Sony's HDW-F900, sans practically everything, is as impressive as its specs and performance: a whopping \$102,360. While that's peanuts for a big Hollywood studio - or, in Lucas's case, a big San Rafael studio — to get my hands

on one of these beauties, I'll have to invoke an even more powerful Force. Dear Santa S&V Sony's HDW-F900 high-definition camcorder, fully accessorized.

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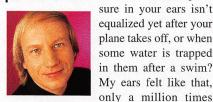
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Hard of Hearing

ord knows which human host the damn virus used to spread its living hell to me. Maybe it was the sickly looking fellow at the ticket counter who handed me my boarding pass. Maybe it was the innocent-looking girl who served me the waffle cone filled with chocolate yogurt on Concourse D. Maybe it was the portly businessman in the seat next to me slumped over and occasionally coughing. Or maybe it was any of the several million other souls in midtown Manhattan that day. One way or another, back in Miami 24 hours later, I was sick.

This magazine's high standards prevent me from detailing the symptoms. It would be inappropriate to tell you how I was simultaneously shivering and sweating. I won't mortify you by describing the feel-

ing of rusty razor blades I'd taken my shredding the inside of hearing for granted, my throat. And under no circumstances would and its sudden I ever tell you about the projectile vomiting loss was startling. But then something re-I soon realized ally terrible happened: iust how



my ears crapped out. You know how it important it was. feels when the air pressure in your ears isn't equalized yet after your plane takes off, or when some water is trapped in them after a swim? My ears felt like that,

worse. From being miracles of creation (or evolution) that could sense the slightest sound, they had become annoying clumps of flabby meat hanging on the sides of my head like mutant earmuffs.

Hearing was something I'd mainly taken for granted, and its sudden loss was startlingly apparent. Conversations were indistinct, music was unappealing, and the sense of detachment from the active world around me was frightening. I suddenly realized just how important my hearing was. That reads like a trivial insight, and perhaps it is. But the sense of loss, even with my relatively minor hearing impairment, was profound.

To help my students think about their sensory priorities, I sometimes present them with a tough hypothetical choice. I ask them whether they'd rather lose their hearing or their sight. Some of them are electrical engineering (EE) majors, others music engineering majors. The EEs tend to give me a practical answer, saying they'd rather lose their hearing because they think loss of sight would be more disabling in the workplace. Not surprisingly, the musicians tend to give me an emotional response, saying they value hearing more highly because that's the stimulus that inspires them most. In my usual schizoid fashion, I side with the musicians, but for a practical reason. If I went deaf, my livelihood in the audio business would be devastated.

Clearly, though, all of us would suffer tremendously from deafness. Imagine never being able to hear music again. Even worse, the difficulty in understanding what other people are saying could lead to social isolation. That people with partial or total hearing impairment can learn to compensate for their loss is a remarkable testament to the human spirit — but it is still a loss.

I'm okay now, restored to what passes for normal. My audiologist assures me that nothing was permanently affected. I am fortunate to have good hearing. Of course, the interesting aspect is that my temporary hearing loss gave me a pre-echo of my future. When I reach an older age (God willing), my hearing will certainly be deteriorated. That's as inevitable as any other aspect of aging — it's natural to accumulate accessories like eyeglasses and hearing aids as we grow older. The gradualness of aging conceals the severity of our losses, which is nature's way of gently helping us through an immense tragedy. It's a simple fact that my sense of hearing, and yours, is gradually failing. That's why it's so important, no matter what our present hearing acuity, to appreciate the gift while we still

Do yourself a big favor — as soon as possible. Put on your favorite piece of mu-

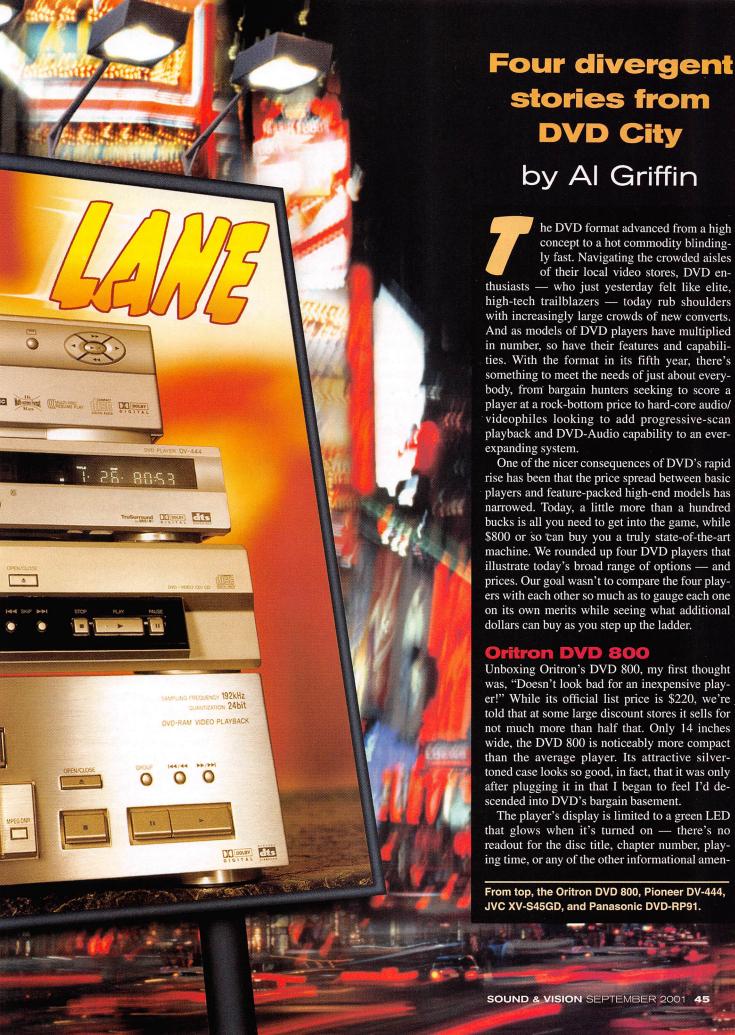


sic, switch off your cell phone, sit back and close your eyes, and listen. Revel in your ability to hear. Better yet, go to a concert tonight, preferably something unamplified and if possible with a late piece by Beethoven on the program. Listen intently, because you're privileged to hear sounds that the great Beethoven could only imagine. Listen to every nuance of tone color and ask yourself, did his deafness inspire him to compose music that hearing musicians of his day couldn't conceive of? As tragic as it was, did his deafness enable him to create sounds that we're all more fortunate for being able to hear? Was his loss our great gain? Afterward, go sit by a lake, or any quiet place, and just listen to your heart beat. Promise yourself that you won't take your hearing for granted. It's far too precious.

Do yourself a few other favors: When you go to a concert of amplified music, wear earplugs, just like the performers up on stage. When you mow your lawn or use power tools, wear earplugs. Have an audiologist test your hearing to make sure it's ologist test your hearing to make sure it's okay and to establish a baseline record. If your hearing changes, go back for another checkup. And one more thing — watch out for the innocent looking girls on Conon- YPERSANI course D.









Oritron DVD 800

DIMENSIONS 14 inches wide, 23/4 inches high,

103/4 inches deep
W=IGHT 61/2 pounds

PRICE \$220
MANUFACTURER Oritron Products

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ities you'd find on other players. (You can access the information onscreen, though, via the remote's Display button.) If not for the large Oritron logo on the front, I'd have sworn it was made by Fisher-Price!

The forlorn feeling I got staring at the barren display

only deepened when I picked up the remote control. Small and flimsy, it provides a smattering of tiny, poorly labeled buttons. At this price, I wasn't expecting a backlit remote, but its buttons didn't even glow in the dark. Then again, none of the other players in this group had backlit remotes, and only the most expensive one had a remote with glow-in-the-dark buttons.

As expected, the video output options were limited to composite- and S-video. Naturally, I used the S-video connection to get the best available image.

It was only after I configured the DVD 800's settings via its goofy, cartoonish onscreen menus (more echoes of Fisher-Price) and finally got around to watching some DVDs that I started to warm up to the Oritron again. Though short on features and ergonomic refinements, it worked just like any other average DVD player. There are four fast-search speeds in both directions, and the two slower speeds provided reasonably smooth images. The player's manual lists a zoom function, but I wasn't able to make it work. In addition to DVD-Video discs and CDs, the Oritron was able to play a rewritable CD-RW and a writeonce DVD-R made on a Macintosh computer's DVD drive, but it failed to read a write-once CD-R disc.

For such an inexpensive player, the Oritron had acceptable audio and video performance. With every disc I watched, it provided consistently clean images and passed the Dolby Digital soundtrack to my receiver without a glitch. In a surreal scene from *The Avengers* (1998) — a board meeting where everyone is dressed in brightly colored teddy bear costumes — the player rendered the garish hues without any color noise or bleeding. I was also impressed by the detail in the furry textures.

The only significant anomaly I encountered came when I viewed static test signals from the Ovation Software *Avia* setup DVD. Eyeballing the sharpness test pattern, I noted both picture

jitter and bleed-through above and below the vertical edges of the pattern's graphics. Fortunately, these problems didn't materialize with the movies I watched, even in graphics-heavy title and credit sequences.

Oritron's DVD 800 is a fully functional DVD player that doesn't sell for much more than an average VCR. At this price you'd expect a manufacturer to cut corners, and you can find evidence of that in almost every aspect of the DVD 800. But when you come right down to it, a DVD-Video player's primary function is to play movies, which is exactly what the DVD 800 does — and surprisingly well, too.

JVC XV-S45GD

With a champagne-gold finish and a sleek display window extending over most of its front panel, JVC's XV-S45GD looks like a much pricier DVD player. So I was surprised to learn that it's the entry model in JVC's DVD lineup and lists for only \$250. Also contributing to the player's

streamlined appearance is a bare minimum of buttons occupying its front panel. Controls include buttons for play, pause, stop, scan, and skip.

The S45GD's full complement of A/V outputs includes component video and both optical and coaxial digital audio jacks. Its solidly built remote control is comfortable to hold, with large, clearly labeled buttons. The keypad is neither backlit nor glow-in-the-dark, but there's enough differentiation in button shape and spacing to let you operate the player in a dimly lit room.

Setup was simplified by an onscreen menu system featuring large, clear graphics. The only thing that struck me as slightly funky was the procedure for switching between the player's component- and S-video outputs. To make the component-video jacks active, you have to press and hold the stop button with no disc inserted — not a complicated maneuver, but an awkward, unintuitive one. JVC packed a few neat disc-navigation features into the S45GD. Pressing the Digest button on the remote control after hitting play calls up a grid of still images pulled from the opening scenes of each chapter on the disc. You can use the arrow keys to select a scene, then hit the enter button to jump directly to it. There are a total of five fast and five slow scanning speeds in each direction, and the 2x and 5x speeds provided impressively smooth motion. Finally, a zoom feature lets you double the size of images and scan across them using the arrow keys on the remote.

The JVC player delivered a crisp, cleanlooking picture through its S-video output. I could see plenty of detail in the earthy cobblestone sidewalks and brick cottages of the rural village John Steed (Ralph Fiennes) strolls through in the opening of The Avengers. And when Emma Peel (Uma Thurman) appears in the next chapter, both her red dress and the pop art paintings lining her walls came across vividly, with no color noise or smearing. The player's relatively poor component-video performance in our bench tests (see "in the lab," page 51) made me wonder if I should even bother using that output. However, when I viewed the same scenes on a big-screen TV using a component-video connection, I didn't see any problems.

The JVC had no difficulty reading any of the discs that I tossed into its tray, including CD-Rs, CD-RWs, and even DVD-Rs. From a user standpoint, the only complaint I had was the painfully long time the player took to read a disc once it was inserted. At times it took so long for a disc to load I figured either the player or disc must be damaged.

JVC's XV-S45GD offers solid performance plus a few cool features at a very reasonable price. Better yet, it looks like the kind of player you'd have to spend a few extra C-notes to get your hands on. The only other things I could ask for would be a progressive-scan output and the ability to read DVD-

JVC XV-S45GD

www.jvc.com; 800-526-5308

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Pioneer DV-444

DIMENSIONS 165% inches wide, 21/4 inches high, 111/6 inches deep WEIGHT 63/6 pounds

MANUFACTURER Pioneer Electronics USA, Dept. S&V, 2265 E. 220th St., Long Beach, CA 90810; www.pioneerelectronics.com; 800-746-6337

Audio discs — features that would raise the price by hundreds of dollars. As it stands, I'm comfortable recommending JVC's entry-level player to anyone looking to join the DVD party without spending a lot of money.

deficiencies, I'd prefer to use my TV set's remote to control the player.

Playing *The Aveng*ers through the Pioneer's interlaced component-video output, I

saw very detailed, robust-looking images. When Sir August de Wynter (Sean Connery's character) tosses poison darts at his fellow teddy bears in the boardroom scene, the texture of the costumes came through clearly, and the colorful fur looked crisp and free of video noise.

When I switched over to viewing DVDs through the player's progressive-scan output, I wasn't nearly as impressed. The picture was comparatively soft, and I could see a small amount of noise in flat patches of color. When I watched some of my progressive-scan torture-test DVDs, such as Chapter 8 of *Dragonheart*, I also noted a fair amount of artifacts on the edges of ob-

Pioneer DV-444

To judge from the rail-thin fashion models we constantly see in magazines and on TV, these are fat-phobic times we're living in. That's one reason Pioneer's DV-444 commanded my attention. At only 2½ inches high, it's one of the slimmest DVD players I've seen. Adding to its appeal is a jewellike silver finish and an uncluttered faceplate that offers only the most essential controls — including play, stop, pause, and skip/scan buttons — plus a three-step dimmer for the LED display.

The DV-444 lists for \$449, although you might find it selling for as much as 40% less at some large retail chains. Its video output array includes a component-video jack that you can set to deliver either interlaced or progressive-scan signals. In addition to DVDs and CDs, it will play CD-RWs, CD-Rs, DVD-Rs, and even discs loaded with MP3 files — a way cool feature in a reasonably priced player.

The Pioneer provides a number of picture controls for both its interlaced and progressive modes. For interlaced signals, there's contrast, sharpness, chroma level, hue, and something called Fine Focus that boosts high-frequency video information. The progressive mode adds controls for noise reduction, Detail, chroma delay (to prevent color bleeding), and gamma (to draw out detail in shadows). You can store your settings in any of the player's three custom memories or select one of two factory presets, Cinema or Animation.

Pioneer packages a very basic remote control with the DV-444. Its keypad isn't backlit, and the small, poorly differentiated buttons don't glow in the dark, making the remote hard to use in dim environments. On the plus side, you can set it up to control your TV — though given the remote's

features checklist

	JVC XV-S45GD (\$250)	ORITRON DVD 800 (\$220)	PANASONIC DVD-RP91 (\$800)	PIONEER DV-444 (\$449)
PLAYBACK CAPABILITIES (in additi	on to DVD-Vid	eo discs and st	andard music CDs)	
CD-R	V	_	V	V
CD-RW	V	V	· · · · · ·	V
DVD-Audio	_		V	—
MP3 CDs		_	V	~
Video CD	V	V	~	~
DVD-R	~	~	V	~
DVD-RAM	_	-	V	-
VIDEO OUTPUTS				
Composite-video	V	√ (2)	√ (2)	V
S-video	V	V	V	V
Component-video	V	_	V	V
Progressive-scan component	_	-,	/ *	V *
* One set of component-video jacks swit	chable between	interlaced and pr	ogressive-scan outpu	ut.
AUDIO OUTPUTS/FEATURES				
Stereo (two-channel)	V	V	V	V
Multichannel analog	_	_	V	_
Digital (coaxial/optical)	VIV	v /—	VIV	VIV
Virtual surround sound	V	_	V	V
Headphone jack	_	_	V	_
DVD-SPECIFIC FEATURES				
Fast-scan speeds (forward/reverse)	5/5	4/4	5/5	3/3
Slow-motion speeds (forward/reverse)	5/5	4/4	5/5	4/2
Frame-step (forward/reverse)	V /—	-/-	VIV	VIV
Resume playback from stop point	V	V	V	V
Bookmarks		10	5	-
Cueing (title/chapter/time)	VIVIV	VIVIV	V/V/V	V/V/V
Repeat (title/chapter/A-B)	VIVIV	—/—/ v	VIVIV	VIVIV
Random playback	V	V	<u> </u>	~
Programmed playback	V	~	V	V
Picture zoom (levels)	v (1)	√ (2)	<u> </u>	_
Digital video noise reduction	-	-	V	V
Selectable black level	_	_	V	_
Dolby Digital/DTS decoders	-/-	-/-	V/V	-/-
Audio dynamic-range control	V	V	V	~

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So, immerse yourself in a completely new level of home theater. Hollywood deserves it. And so do you.









The Avengers tested the chops of these players much as Sir August de Wynter challenges John Steed and Emma Peel in the movie.

jects and in areas of fine detail. Such flaws are the result of a line-doubling circuit that lacks 2:3 pulldown (often called 3:2 pulldown, but 2:3 is more accurate) to compensate for the different frame rates of video and film. On the plus side, the Pioneer's progressive-scan output was free of the color streaking that we've observed in the images from a few other, more expensive progressive-scan players we've tested.

Pioneer packed a number of interesting features into the DV-444, and it performed fine through its interlaced output. But the one feature that really comes as a surprise for a player in this price range - its progressive-scan output — failed to deliver all the goods. Still, if you're looking for an ultra-slim DVD player that offers MP3 playback along with everything else, this Pioneer model might be for you.

Panasonic DVD-RP91

With a faux brushed-aluminum faceplate and angled front-panel display, Panasonic's DVD-RP91 looks like the kind of component a rich guy would drop three grand on without batting an eye. So if you do happen to get sucked in by the RP91's styling, you'll be glad to know that it's priced at an earthbound 800 bucks. In a world of very inexpensive DVD players, that may still seem like a lot — until, that is, you peek under the Panasonic's hood. Not only does the RP91 deliver progressivescan video signals with 2:3 pulldown, but it also plays DVD-Audio discs, CD-R and CD-RW discs encoded with MP3 files - it even plays DVD-RAM Type 2 discs, like those used in DVD camcorders and DVD-RAM recording decks.

The front-panel controls include the usual assortment of play, stop, pause, and scan/skip buttons. In addition, there are buttons to select interlaced

or progressive-scan output, switch off the video circuits for listening to CDs or DVD-Audio discs, and turn digital video noise reduction on or off. Another button labeled Re-master upconverts CD audio tracks to an 88.2-kHz sampling rate. Interesting feature, but I couldn't hear any difference.

The remote control is crowded with a fair number of buttons, most of them encircling a central joystick control on the upper half. Although the keypad isn't backlit, the buttons do glow in the dark and are nicely differentiated in shape and size. The remote can be set up to control a few functions of a TV, including power on/off, volume up/down, and channel selection.

As you might expect from a player this packed with features, setup was a bit more involved than usual. I chose the lighter, standard setting of the player's black-level control (7.5 IRE) — there's also a dark setting that delivers boosted, though inaccurate, contrast - and then selected my display type. The four options are somewhat confusingly called Direct-View, CRT

Projector, LCD Projector, and Projection TV (meaning rear projection).

There's another menu to select speaker size and delay times when the player's internal Dolby Digital/

DTS decoder and 5.1-channel analog audio output are used. As in most other current DVD-Audio-compatible players, however, the Panasonic's bass-management settings don't apply to DVD-Audio playback, which in most cases generates six full-range analog signals that must be sent to a preamp or receiver's multichannel audio input.

Hitting the display button on the remote while playing a DVD calls up a number of additional menus. Some of these unlock strange and useless features, such as presets that lend the video a negative, blackand-white, or sepia look. Bizarre. Others are more useful. The video-adjustment menu allows you to make fine adjustments to contrast, brightness, sharpness, color, gamma, and three separate types of noise reduction. Additional adjustments become available when the progressive-scan output is active. The player remembers the individual settings you've made for as many as 200 discs — possibly your entire DVD collection.

One especially cool feature of the RP91 is aspect ratio control when the player is in progressive-scan mode. The control lets you display a 4:3 image on a 16:9 screen with correct geometry, either at center screen for 4:3 images, or zoomed to fullscreen for nonanamorphic letterboxed programs. This feature is important because many HDTV monitors with 16:9 screens lock into a widescreen display mode when fed a progressive-scan signal from a DVD player. This isn't a problem if the disc is an anamorphic widescreen transfer. But if the program is in the standard 4:3 aspect ratio — full-screen or letterboxed — the widescreen display may stretch the image, making it look distorted and unnatural.

The Panasonic produced fine-looking images from its interlaced output, but the player's outstanding feature was its progressive-scan output. Viewed on a widescreen HDTV monitor, the boardroom

> scene from The Avengers was rich in contrast, the colors deeply saturated without appearing soft, with loads of fine detail visible in the furry costumes. The image was solid and filmlike, and no motion artifacts accompanied vertical camera moves.

Readers who've been following the progressive-scan DVD player tests in Sound & Vision will be happy to learn that I detected none of the color-streaking artifacts that have plagued other players we've recently tested. In "Ringo's House" from the Beatles' animated Yellow Submarine, for example, the edges be-

Panasonic

anasonic DVD-RP91

DIMENSIONS 17 inches wide, 4 inches high, 101/2 inches deep

WEIGHT 73/4 pounds

IANUFACTURER Panasonic, Dept. S&V, One Panasonic Way, Secaucus, NJ 07094; www.panasonic.com; 800-211-7262







tween the red and blue stripes of Ringo's shirt looked completely solid and straight. On a few other players I've used - including some costing more than twice as much as the RP91 — the red stripes had streaky, jagged edges that were pretty distracting.

To test DVD-Audio performance, I played the Buena Vista Social Club disc (Warner Bros.). On a five-channel mix of "De Camino a la Vereda," the lead vocal emanates from the front left/right speakers while a chorus of backing vocals spreads around to the rear and trumpet runs and percussion instruments come at you from all sides. The trumpet sounded extremely vivid, crisp, and lifelike. Listening with my eyes closed, I felt as if I was sitting among the musicians as they played.

With its all-around excellent video quality, DVD-Audio playback capability, and competitive \$800 price, Panasonic's DVD-

RP91 is the most impressive DVD player I've had my hands on so far. Its ability to read DVD-RAM discs helps sweeten the deal, although that feature won't be much of a factor until DVD recorders become more widely available and prices reach more affordable levels. (So far the only stand-alone DVD-RAM recorder is the \$4,000 model Panasonic introduced last year, although the company plans to offer a \$1,500 DVD recorder in October.) In a world where \$800 won't get you a great many things, it's nice to know that it can buy a state-of-the-art DVD player.

've been amazed at how quickly the DVD format has found acceptance with the general public. And now that I've had a chance to try out these four players, I'm also amazed how closely performance and features correspond with price — at least with DVD players, you tend to get what you pay for. With its progressive-scan output, DVD-Audio playback, and other advanced features along with its excellent video and audio performance, the Panasonic DVD-RP91 more than justifies its price. Pioneer's DV-444 also offers progressive-scan playback, but owing to its less-than-stellar image quality in that mode, I'd mainly recommend it to someone looking for a DVD player that also handles MP3 playback. The entry-level JVC XV-S45GD offers solid features and performance at a very reasonable price. Finally, Oritron's heavily discounted DVD 800 gets you into the game with a few compromises in features but little compromise in basic performance. One of these players is the right fit for you. So hurry up and go get one! What are you waiting for?

in the lab

	JVC XV-S45GD	ORITRON DVD 800	PANASONIC DVD-RP91	PIONEER DV-444
DVD VIDEO PERFORMANCE (test patterns from various test D)	Ds using compos	ite-video output ex	ccept as noted)	
Setup level	7.5 IRE	7.5 IRE	0/7.5 IRE	7.5 IRE
100%-white-level error	+8 IRE	-4 IRE	+1 IRE	0 IRE
Differential phase	8°	4.5°	1°	1°
Differential gain	14 IRE	6 IRE	0 IRE	1 IRE
Horizontal luminance frequency response (re 1 MHz)				
at 4 MHz	-1.9 dB	+0.34 dB	-0.35 dB	0 dB
at 5 MHz	-4.0 dB	-0.35 dB	-0.18 dB	-0.54 dB
at 6 MHz	-6.2 dB	-1.1 dB	-0.63 dB	-1.8 dB
at 6.75 MHz (DVD limit)	-6.7 dB	-1.6 dB	−1.6 dB	-2.7 dB
Equivalent onscreen resolution	540 lines	540 lines	540 lines	540 lines
In-player letterboxing	poor	good	fair	good
Component-output level error				
Υ	+1.3%	NA	+3.2%	+0.3%
P _r	+22.5%	NA	-5.7%	-0.2%
P _b	+21.3%	NA	-5.1%	-0.6%
Component-output timing error				
P _r (in nanoseconds, or ns)	+44 ns	NA	+1 ns	+17 ns
P _b (in nanoseconds)	+44 ns	NA	0 ns	+20 ns

On the whole, these players did fine on the test bench, with the best performance on the numerical video parameters turned in by the Oritron Panasonic, and Pioneer. Other aspects of video performance, such as the quality of a progressivescan output or in-player letterboxing, are visual judgment calls. The JVC gave an excessively bright picture with the default setting (0) of its Theater mode. Its picture was also slightly softer than those of the other players due to the faster rolloff of its video frequency response. The Panasonic had a slightly flatter video response when its sharpness control was set to +1.

The multichannel analog output of the Panasonic player, the only one here to have this feature, provided very good decoded Dolby Digital signals. The noise level from this output measured -73.1 dB, for example, and the other results were similarly fine. The Panasonic's bass managment, which was activated only for Dolby Digital programs, had a crossover frequency of 100 Hz. Its subwoofer output will not overload if you set the subwoofer-level trim control to -5 or lower. DVD-Audio performance was also fine. While the excess-noise figures are a bit high by 24-bit standards, the player sounded quiet and clean.

DVD AUDIO PERFORMANCE (Panasonic)

All tests were done using a custom-made test DVD-R consisting of computer-generated signals containing dither, which sets performance limits on distortion and noise. Results are representative, not necessarily worst-case. In all cases, the kHz figures in the test conditions (left) represent the sampling rate of the digital signal.

Noise level (re -20 dBFS, A	A-wtd, 24-bit signals)
44.1 kHz	84.9 dB
48 kHz	84.9 dB
88.2 kHz	83.8 dB
96 kHz	83.8 dB
176.4 kHz	81.0 dB
192 kHz	80.6 dB

Frequency response

44.1 kHz	20 Hz to 20 kHz +0, -0.46 dB
48 kHz	20 Hz to 21.3 kHz +0, -0.55 dB
88.2 kHz	20 Hz to 38.6 kHz +0, -2.2 dB
96 kHz	20 Hz to 42.1 kHz +0, -2.7 dB
176.4 kHz	20 Hz to 76.3 kHz +0, -2.9 dB
192 kHz	20 Hz to 83.2 kHz +0, -3.6 dB

Excess noise (re perfect 24-	-bit performance)
48 kHz	+38.7 dB
88 kHz	+39.41 dB
96 kHz	+38.8 dB
176 and 192 kHz	+42.7 dB

Noise modulation

nelse measuren		
41.1 to 176 kHz	<0.25	c
192 kHz	1.5	C

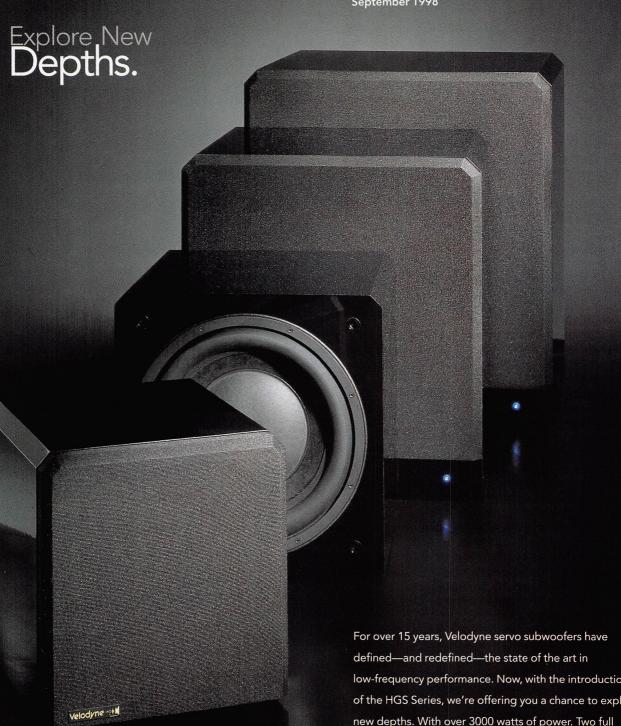
Noise modulation in DVD-Audio playback was commendably low.

Although most people will (and should) use these players' digital audio outputs even for stereo soundtracks and CDs, the JVC player's stereo analog outputs gave outstanding results. As a CD player, it is state of the art, with quasi-20-bit excess noise of only +7.9 dB and performance in other areas very close to theoretical perfection. It was followed in stereo audio performance by the Panasonic and Pioneer (in a virtual dead heat), with the Oritron player bringing up the rear.

— David Ranada

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Stereophile Guide to Home Theater, September 1998



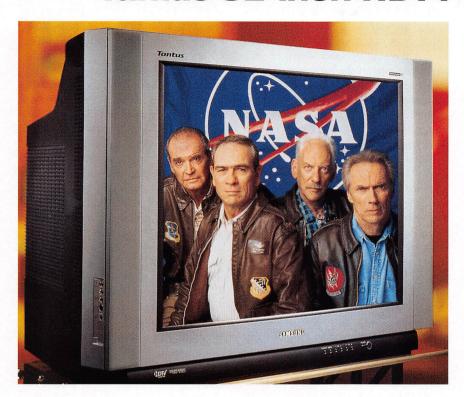
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dealers worldwide.

Samsung

Tantus 32-inch HDTV Monitor



amsung's sleek, silver-framed Tantus TSL3295HF monitor screams "high-tech." The unusual flat-screen tube will spark conversation. The HDTV (high-definition TV) and Tantus Digital logos, the speakers mounted on the sides, even the minimal array of front-panel buttons all bespeak technological sophistication. And that's before you even turn it on.

This 32-inch beauty is the company's least expensive big-screen set capable of displaying high-definition programs fed by an outboard digital tuner. With its traditional 4:3 aspect ratio, however, it's better suited for displaying conventional programs than HDTV - not exactly a huge problem when you consider that most TV programming will be in the squarish standard format for some time to come.

Samsung's engineers obviously considered the American penchant for bells and whistles when designing this set. In addition to picture-in-picture (PIP) and a builtin line doubler, the TSL3295HF includes aspect ratio control and picture-outside-picture (POP), which displays two equal-size images side by side. Three aspect ratio settings are provided: Normal for standard TV, Wide for HDTV and widescreen (anamorphic) DVDs, and Zoom for magnifying images.

The POP feature is more commonly found on widescreen sets, and for good reason since it works better when the screen is extra wide. On the Samsung's screen, the POP images were distorted (human figures looked very stretched), so I think most people will prefer the more traditional, very flexible PIP mode. Both modes work only for analog video signals (including those from progressive-scan DVD players), not digital TV signals.

There's also a handy still-picture feature, which freezes the image so you can write down a Web address or phone number. Since the sound continues despite the frozen image, I had fun rapidly freezing Larry King's talking head on and off in the midst of an interview. There are Standard

and Mild picture presets as well as Normal, Cool, and Warm color-temperature settings. I'd have liked individual picture memories for each video input, but there's only one global Custom setting.

The Samsung's 45-watt sound system is above par, providing Dolby Pro Logic decoding complete with rear-panel jacks for feeding optional center- and surroundchannel speakers, five sound presets, and a five-band equalizer. There's even a headphone jack with volume control.

The set's component-video input accepts 1080i-format HDTV as well as standard and progressive-scan signals from a DVD player. I was disappointed to see only one set of component-video jacks, which forces you to switch signals externally if you have more than one component source. The set also provides only a single rear-panel Svideo input. That's not nearly enough.

With such a cool-looking set in the entertainment center, it makes sense to have a slick remote on the coffee table. Samsung's silver wand certainly qualifies. The remote's uncluttered design hides littleused buttons behind a flip-up panel, and it can control VCRs, DVD players, and cable

fast facts

KEY FEATURES

- Displays 1080i-format HDTV programs from an outboard HDTV tuner
- Upconverts standard 480i signals to 480p
- Displays anamorphic DVDs with full resolution
- Flat 4:3 picture tube

INPUTS/OUTPUTS

side panel A/V input with composite/S-video, stereo audio; headphone jack rear panel 1 S-video, 1 wideband

component-video, and 3 composite-video inputs, all with stereo audio; antenna input; composite-video and stereo audio output; center- and surround-channel speaker-level outputs

DIMENSIONS 357/8 inches wide, 267/8 inches high, 231/8 inches deep

WEIGHT 169 pounds

PRICE \$1,600

MANUFACTURER Samsung

Electronics America, Dept. S&V, 105 Challenger Rd., Ridgefield Park, NJ 07660; www.samsungusa.com; 800-726-7864

test report

HIGH POINTS

Flat screen and sleek styling.
Variable aspect ratio
for widescreen programs.
Reasonable price.

LOW POINTS

Black level fluctuates between scenes.

Not enough component- and

S-video inputs.

boxes (but not satellite receivers). Though the remote is not backlit, a side-mounted Mode button cleverly lights different LEDs to indicate which component is subject to control.

The first thing I noticed when I fired up the set was its extremely bright picture. In Normal mode, contrast is preset at 100%, a

> level that could easily damage the tube when it's displaying static images like network logos. The test patterns I used to take measurements on the set are static, and I noticed phosphor burn a creeping redness at the edge of a white box — after only a short period of time. My other first impressions of the set's picture were that its scanvelocity modulation (SVM) circuit made Larry King's face look artificially sharp and his flesh tones oversaturated and much too red.

After I calibrated the set (see "in the lab"), its picture improved immensely. The excessive brightness was tamed, and the color temperature measured close to the

6,500-K NTSC standard. I was even able to turn off SVM using the set's service mode, which eliminated the hard, "ringing" edges I'd been seeing. Larry King now looked human!

SAMSUNG

The benefits of the widescreen display mode (which vertically squeezes the set's raster to a 16:9 area) were visible immediately when I played an anamorphic transfer of *Space Cowboys* on a Panasonic progressive-scan DVD player. The well-wrinkled faces of senior citizen astronauts Tommy Lee Jones and Clint Eastwood looked sharp and detailed right down to their bushy gray eyebrows. If the Samsung lacked a wide-

screen mode (as do a few other 4:3 HDTV monitors), I'd have had to depend on the DVD player's letterboxing, which couldn't have delivered the same level of detail in the shuttle's cockpit controls.

One scene from *Space Cowboys* really tested the Samsung's ability to maintain a consistent level of black: An astronaut gets tangled up with the robot arm, and panoramic shots of a tiny shuttle suspended against the void of space alternate with bright closeups of the astronaut's helmet and equipment. In the panoramic shots, the expanse of space looked a solid, inky black. When the astronaut's white gear filled the frame, however, the black background seemed several shades lighter.

Although the Samsung's built-in line doubler lacks the 2:3 pulldown feature (also called 3:2) found in the best line doublers, the set's picture was relatively sharp and well defined, though in a few cases artifacts were still visible. For example, during a scene in *Space Cowboys* where the shuttle slowly rotates as it approaches the camera, jagged lines were visible along the leading edge of the wing — but only when the DVD player was set to its interlaced output. Once I switched back to the progressive mode, bypassing the set's line doubler, the wing looked solid.

The set's spec sheet rates its maximum horizontal resolution at 800 lines, which means that it can't deliver the full level of detail in 1080i-format HDTV programs — something I really didn't expect from a 32-inch direct-view TV. Watching nature footage from Dish Network's HDTV demo loop, I couldn't distinguish the individual grains of sand in the nest of a loggerhead turtle, but the image still looked much more



detailed than DVD. That's more than I can say for some other small-screen HDTV monitors I've seen. The colorful shell and leathery fins looked sharp and realistic, and I could easily appreciate the texture of the turtle's eggs.

Overall, the high-def image looked spectacular - provided I didn't sit more than 5 feet from the screen. Unfortunately, that distance proved a little too close for watching standard TV. Although the set's line doubler helped to conceal the scan lines, standard programs from satellite sources viewed at that close distance were visibly noisy and soft. Engaging the set's video noise-reduction feature didn't help, but when I moved my chair back about 3 feet, the image quality improved greatly. Bottom line: with a 4:3 monitor this size, the optimum viewing distance depends on whether you're watching standard squarish TV or widescreen HDTV.

The Samsung Tantus TSL3295HF is the least expensive HDTV monitor we've tested. At \$1,600, it costs hundreds less than the similarly styled 32-inch Sony Wega HDTV, and it offers many comparable features. That alone would be enough to recommend it, barring the few problems I mentioned with picture quality, especially its ability to hold blacks. But if you want no-compromise picture quality, you can expect to spend a lot more money. Samsung's Tantus HDTV monitor proves that you *can* get into digital TV without going deep in debt.

in the lab

COLOR TEMPERATURE

BRIGHTNESS (6,500-K setting, before/after calibration)......95.2/30.1 ftL

Out of the box, the Samsung TSL3295HF was set to maximum contrast and high color temperature, resulting in overly bluish white areas and phosphor burn after about 10 seconds in the high (100-IRE) window from the Ovation Software Avia DVD. After calibration, the set met the NTSC color-temperature standard of 6,500 K and tracked the grayscale well, fluctuating within 200 K from the low to the high end of the scale. (Calibration needs to be performed by a

qualified technician with specialized equipment, so discuss it with your dealer before purchase, or call the Imaging Science Foundation at 561-997-9073.) Brightness was very high initially, but after calibration it was nearly optimal for a direct-view TV. The set's ability to hold a consistent black level was below average, causing the blacks to fluctuate depending on program content. Resolution with DVD test patterns measured the maximum 540 lines.

The 3-D comb filter displayed few artifacts on the SMPTE color-bars pattern. The NTSC color decoder accentuated red, so the set's color control needed to be turned down to achieve a more accurate picture. The screen geometry required calibration to center the image and reduce distortion. — D.K.



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Newton Series T500 by Cambridge SoundWorks

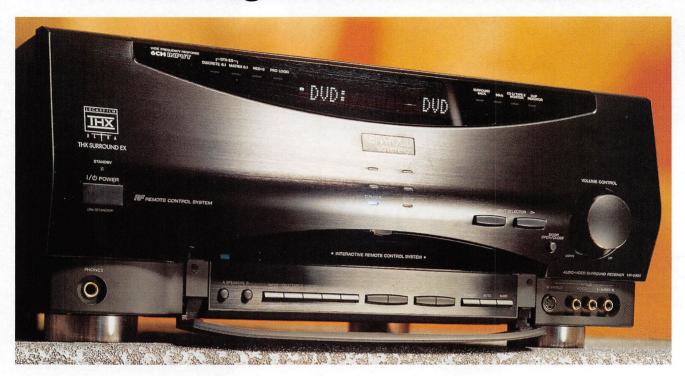
Four-way tower speakers with 300-watt dual-driver powered subwoofer. "Phenomenal, amazing...simply stunning." - Review Board magazine \$2,199.99pr





Kenwood

VR-5900 Digital Surround Receiver



espite a relatively austere front panel for a state-of-the-art, THX Ultra-certified receiver, the Kenwood VR-5900 literally bulges with concealed powers and abilities. For example, it decodes all of the current so-called 6.1-channel surround sound formats. But the controls for these and most of the other features that make this do-almost-everything receiver special are stashed away on its touchscreen remote control — perhaps its main claim to fame.

While the front-panel controls (most of them hidden behind a fold-down door) can operate many of the receiver's primary functions in a pinch, you're going to greatly prefer using the remote. This relatively large, hefty device runs on four C cells, but it can also be powered by an optional external adapter, which I'd recommend if your coffee table can accommodate the power cable.

Touchscreen remote controls are usually pretty nifty, and the VR-5900's remote proved no exception. It uses radio-frequency (RF) signals to stay in touch with the mothership, which means you don't have to aim the remote in any particular direction to operate the receiver, which can therefore be placed out of sight — even around a corner and some distance away. (I got it to work from a good 20 feet down the hallway outside our listening room — with the door closed!)

The preprogrammed "universal" commands in the remote's memory for controlling DVD players, VCRs, audio recorders, and so on are emitted from the handset as infrared (IR) signals, not RF, so you do have to be in the same room with these devices and aim the remote to operate them. For example, the remote's stubby-knob joystick, used for navigating DVD menus, is an IR feature. The IR commands are limited in scope and probably won't cover everything that devices with lots of features can do. So don't throw away the IR remotes from your other components.

Like other RF remotes, this one has some quirks. Foremost is that placement of the receiver's RF antenna - a small Tshaped piece of wire — is crucial for reliable remote operation. Don't just let it dangle from the connector on the rear panel of the receiver: tape or tack it onto a wall away from other wires or large pieces of metal (including other electronic components in your A/V system). Bad antenna placement can prevent the receiver from responding to commands or — worse cause it to get out of sync with the remote. When this happens, the receiver responds to remote commands in ways that don't correspond with the buttons you pushed or with the readout on the remote. (This hap-

fast facts

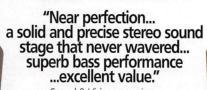
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key features

- Dolby Digital, DTS, and digital-domain Dolby Pro Logic decoding with full THX post-processing
- THX Surround EX decoding for Dolby Digital EX and DTS-ES Matrix/Discrete 6.1-channel soundtracks
- Dolby Pro Logic II and DTS Neo:6 processing for multichannel playback of two-channel material
- 7 optical and 7 coaxial preassigned digital audio inputs
- 6 A/V inputs and 2 A/V outputs, all with S-video
- 2 component-video inputs, 1 componentvideo output
- 6-channel external analog audio input
- 4 analog audio-only stereo inputs, 3 outputs
- Phono input
- Preamp outputs for all channels, including 2 outputs for external power amplifier for back surround speakers
- Multiway binding posts for all speaker outputs
- Stereo line-level and speaker-level audio outputs and IR-repeater/relay-control facilities for multiroom applications
- Backlit, touchscreen RF remote control with built-in joystick and preprogrammed IR commands for other components

pened to me while I was balancing the speakers during setup of the VR-5900.) Fortunately, the remote's Confirm switch will set everything straight — assuming its signal is received correctly.

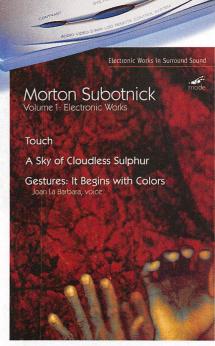
Otherwise, the setup procedure was actually fun. The touchscreen remote made it seem like I was doing business with an ATM or playing a handheld electronic game (am I a geek, or what?). The touchscreen also let me use the remote to handle functions like entering text for radio-station presets, activating home-automation equipment, and making selections for secondzone playback. If all these functions had to be handled by a conventional handset, it would need hundreds of buttons.

During setup, I was also impressed by the VR-5900's huge array of digital audio connectors — there are enough of them that each is preassigned to a particular input, obviating the tedious task of input assignment that many receivers require you to perform. I also liked the transparent multiway speaker binding posts, which made the correct insertion of stripped wires much easier than usual.

It almost goes without saying that a THX Ultra-certified receiver like the VR-5900 would breeze easily through the various high-amplitude metallic bangs, twangs, and zings that — along with Tan Dun's music — propel the swordfight scenes in Crouching Tiger, Hidden Dragon. But the loudest effects in this and other actionmovie soundtracks seemed mere whispers in comparison with the levels the receiver was able to generate with a spectacular recent DVD of synthesizer music by Morton Subotnick (Mode Records). This disc. which contains the same music in the multichannel DVD-Audio, Dolby Digital, and DTS formats, has the greatest dynamic range of any commercial multichannel recording I have heard to date.

Parts of Subotnick's A Sky of Cloudless Sulphur and Gestures: It Begins with Colors were almost terrifyingly massive, while others were so quiet I had to strain to hear the music - and this was with the Dolby Digital version! If you can get over the idiom — the first work, Touch, is a quadraphonic recording dating from 1969 that sounds like it was written for a chorus of R2D2 droids — the DVD will give your system a tough workout from receiver to speakers. This is especially true in the surround channels, which are comparatively underutilized in most of the multichannel music recordings I've heard.

Thanks to its low noise levels and large power reserves, the VR-5900 easily met all of Subotnick's sonic challenges, never sounding strained even when the music was going full tilt in all channels. The multichannel imaging and directionality ef-



The Kenwood VR-5900's exceptionally wide dynamic range enabled it to do justice to this stunning DVD-Audio disc of electronic music by Morton Subotnick from Mode Records.

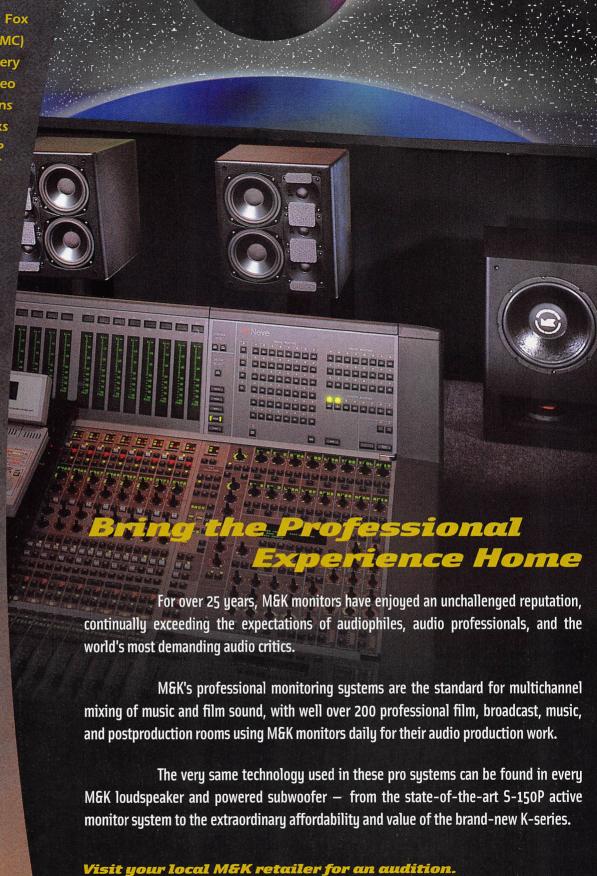
fects on the disc came off marvelously well (it helps that some of the pieces were originally conceived for multichannel playback instead of being remixed after the fact). The receiver's excellent bass management (another characteristic of THX-certified models) ensured that the high-level deep bass in the surround channels was cleanly rerouted to the subwoofer - but only for multichannel Dolby Digital and DTS playback and for analog stereo, not for multichannel DVD-Audio or SACD playback using the receiver's six-channel analog input.

The VR-5900 did extremely well with more conventional music, too, especially given its unusually varied menu of enhanced multichannel processing for twochannel material. There are all the usual ambience-enhancement modes - including the seemingly unavoidable and always useless Stadium setting - each with adjustable "room size," "wall type," and effects level. What's unusual about these









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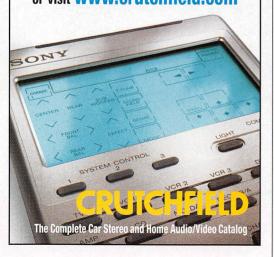
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test report

modes, and makes some of them more useful than their typical counterparts on other receivers, is that they add only artificial early reflections — there's little, if any, artificial reverberation, which is usually done poorly and ends up coloring the sound.

Two of the processing modes for turning stereo material into something resembling a true multichannel program come directly from Dolby and DTS — Dolby Pro Logic II (or DPL II) and DTS Neo:6. Each of these comes in two flavors, one optimized for soundtracks and the other for music. As typically happens with such processing,

the effect produced depends very much on the recording — some material sounds better with one mode or flavor rather than another, depending on the type and degree of surround effect you want.

If I had to make some generalizations, I'd say that the DTS Neo:6 Music setting was most appropriate when the music was fast, the rhythms "busy," and the ambience and reverb artificial. Dolby Pro Logic II's Music mode sounded better on everything else, but especially with simpler textures and acoustic music (classical or jazz, especially). DTS Neo:6 seemed to produce bet-

in the lab

DOLBY DIGITAL PERFORMANCE

All data were obtained from computergenerated Dolby Digital test signals containing dither, which sets limits on measured distortion and noise performance. Reference input level is –20 dBFS, and reference output is 1 watt into 8 ohms. Reference output was obtained with the volume control set to –3 dB. Dialogue normalization is 27. All are worst-case figures where applicable.

Output at clipping (1 kHz into 8 ohms) one channel driven175 W (22.5 dBW) five channels driven110 W (20.5 dBW)
Distortion at 1 watt (THD+N, 1 kHz) 8/4 ohms0.034%
Noise level (A-wtd, 16-bit signal)74.3 dB
Excess noise (with sine tone) 16-bit (EN16)+1.35 dB

Frequency response (see notes) surrounds......30 Hz to 20 kHz +0.24, -3 dB Subwoofer-output frequency response

24 dB/octave rolloff above –6-dB point of 80 Hz High-pass-filter frequency response

12 dB/octave rolloff below –3-dB point of 80 Hz

Maximum unclipped subwoofer output
(at reference volume setting)9.0 V

Subwoofer distortion (6-channel, 31-Hz, 0-dBFS signal at reference level; subwoofer trim -3)......0.06%

STEREO PERFORMANCE, DIGITAL INPUTS

Volume setting for reference output level was -3 dB. Speakers were set to "large," subwoofer off.

Output at clipping (1 kHz, 8/4 ohms, both channels driven)118 W (20.75 dBW)/222 V

channels driven) 118 vv (20.75 dBvv)/222 vv
Distortion at 1 watt (THD+N, 1 kHz, 8/4 ohms)0.035/0.076%
Linearity error (at -90 dBFS, see notes)1.7 dB
Noise level (A-wtd)74.5 dE
Excess noise (with/without sine tone, see notes) 16-bit (EN16)+3.9/+1.15 dE quasi-20-bit (EN20)+17.2/+17.2 dE
Noise modulation2.7 dB (see notes)
Tone-control range

100 Hz	+8.0/-7.8 dB
10 kHz	+7.1/-8.2 dB

Frequency response (tone controls off) 44.1-kHz rate......20 Hz to 20 kHz +0, −0.25 dB 96-kHz rate...20 Hz to 45.9 kHz +0.49, −0.24 dB

For the most part, the VR-5900's measured performance on the test bench ranged from excellent to superb. In Dolby Digital operation, its low noise levels combined with the substantial power reserves required of THX Ultra-certified receivers to give it unusually wide dynamic range. (Kenwood rates the receiver with 6-ohm. loads, like other THX Ultra devices, but our tests are conducted with 8-ohm loads, which results in lower power readings.) The low-end response of the surround channels rolled off a little early, even with "large" speaker settings, but given the size of most surround speakers, this may actually be a benefit. As long as the subwoofer level control is set at -3 or lower, the subwoofer output will not overload even with worst-case multichannel signals.

My only concerns are the interrelated noisemodulation, linearity, and excess-noise results in stereo operation. The small errors here which are, I must stress, not quite audible probably resulted from Kenwood's proprietary Dynamic Resolution Intensive Vector Enhancement, or D.R.I.V.E. III, a strained acronym for digital processing that's automatically applied to all program material except Dolby Digital. The manual tells us this system is "for reproducing signals with high resolution by instant switching of the internal filters according to the input signal," but it also seems to produce the signaldependent variations in the digital noise "floor" and spectrum that I encountered in the lab. D.R.I.V.E III processing does not activate during Dolby Digital decoding, leading to that mode's superior measured performance in these noise-related areas. This is yet another example of the hazards of not leaving well

HIGH POINTS

Remote control is easy and fun to use.

Outstanding dynamic capabilities.

Dolby Pro Logic II decoding with
adjustable music settings.

Lots of digital audio inputs.

Excellent Dolby Digital/DTS bass
management.

LOW POINTS

Requires external power amplifier for 6.1-channel operation.

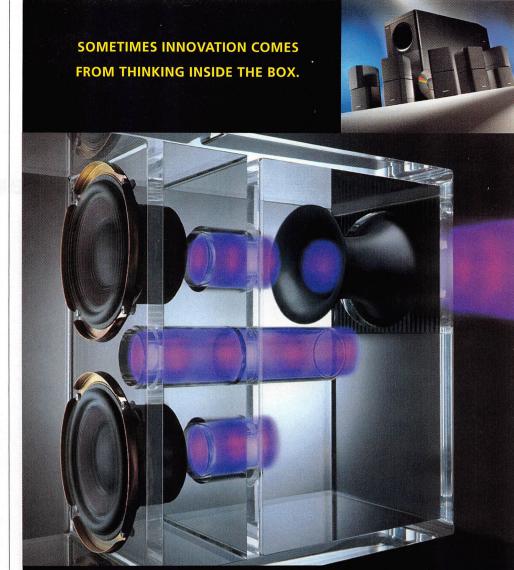
Remote control can lose track of receiver settings.

No bass management on external multichannel analog input.

ter results with monopole (direct-radiating) surround speakers placed slightly to the rear of the listener and at ear level, while DPL II worked better with elevated dipole surrounds located to the sides. Kenwood's implementation of DTS Neo:6 did suffer, however, from the same weird dissonance-creating effects that I've heard from other versions. This effect is particularly evident (and distracting) with simple musical textures, like a solo instrument or voice, moving at medium to slow speed.

Kenwood's DPL II Music mode, but not DTS Neo:6, allows for several user adjustments. You can select how much frontchannel signal is fed to the surrounds, the relative level of front and surround speakers, and — most important to my ears — the "width" of the center-channel image. This last control eliminates the tendency of the front-stage image to collapse toward the center speaker if you use plain DPL to play stereo music.

You can spend hours playing with these controls and testing their effects on all types of music — at least I did. For most, if not all, stereo recordings, you'll be able to find a setting that provides surprisingly effective surround sound, if not the equal of a true multichannel remix. After you've experienced the VR-5900's superb performance with original multichannel material, you're going to need its ambience-processing capabilities to keep your old recordings from sounding two-dimensional. But what is most impressive about this exceptional receiver is its touchscreen RF remote, which gives you easy access to its wealth of features and makes using them that much more enjoyable.



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B&W

CM Series Home Theater Speakers



inally — a speaker system for home theater that reverses the trend of ever-smaller satellites and ever-larger subwoofers. Instead, B&W's CM Series setup consists of a pair of large floor-standing front speakers and medium-size center and surrounds, while the subwoofer is barely bigger than a case of your favorite brew.

The CM 4 towers are simple, largely conventional "2½-way" speakers that could serve well as a stand-alone stereo pair. But they might be even better suited for a sub-woofer-supplemented home theater because they play down to 40 Hz, dramatically easing the common setup problem of achieving a seamless blend between satellite speakers and the subwoofer. The CM C center speaker and the CM 2, which we used

for the surround channels, aren't radically innovative, either. Though not huge, they're still bigger than the center and surround speakers in many other systems.

All five main-channel speakers are vented with B&W's heavily dimpled Flowport, which is said to reduce air turbulence (and hence port noise). And all five are handsomely veneered, with elegant brushed-aluminum front baffles that subtly set off their aluminum woofers, aluminum-alloy tweeters, and yellow woven-Kevlar "mid-

woofers" — the "½" in "½½-way." With their grilles off, the speakers are visually striking.

The unconventional member of this B&W sextet is the diminutive ASW 2500, a supercompact subwoofer that would

look at home in a miniaturized, home-the-ater-in-a-box system. It's black and plain, as any self-respecting subwoofer should be. More significant, the ASW 2500 is one of a recent generation of "Honey, I shrunk the sub" bass boxes that seem to cheat the laws of physics by exchanging large cones and capacious enclosures for small, ultralong-throw woofers, innovative electro-acoustic design, and ultra-high amplifier power — in this case, up to 1 kilowatt of short-term oomph.

Installation was a mere matter of sweating the cabinets into place and swapping cabling, connecting the sub to my surround processor's line-level sub output and the five main speakers to my 150-watt-per-channel power amp. Program sources were a DVD-Audio/Video player and an HDTV tuner.

Setting up the speakers required less decision-making than for many sub/sat arrays because the sub has only line-level inputs. There are two additional pairs of RCA jacks marked Link Out, for feeding another sub, and Line Out, which can send a high-pass-filtered signal to a power amp. Alongside the usual level and low-pass crossover knobs, auto/on/off power switch, and 0/180° phase switch, the ASW 2500 has two more toggles: Lowpass Filter Out/ In, to defeat the on-board filtering if you're using the crossover in an A/V receiver or processor, and EQ A/B, to select between two different bass-equalization curves. The manual is fairly reticent on these, saying only that EQ A is optimized for the highest listening levels while EQ B is tuned for the deepest bass extension and "tighter sound."

I tried EQ B first, of course. And for starters I dialed in a standard 80-Hz crossover from my processor and set all main speakers to "small" in its bass-management setup, thus routing bass frequencies below





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test report

80 Hz to the sub. Then I replaced my reference front speakers with the B&W towers, putting the ASW 2500 just to the left of the left tower - normally the best subwoofer location in my room. The CM C center went atop my 30-inch widescreen Princeton Graphics HDTV monitor, while the CM 2 surrounds were on flanking shelves above and a bit behind the listening position, turned slightly toward it.

Before firing up the all-channels extravaganzas, I started with some simple twochannel listening to check how the CM 4 towers performed full-range on their own (without the subwoofer). With excellent recordings like Maria Muldaur's marvelous Richland Woman Blues (Stony Plain), the CM 4s sounded little short of stellar, with smooth, "deep" midrange and relaxed yet airy treble. The transients of the title track's guitar were tinglingly lifelike.

What made the sound a little short of stellar was a very slight thickness in the lowest midrange frequencies, such as in Yo-Yo Ma's cello part in the Crouching Tiger, Hidden Dragon soundtrack. However, B&W lets you do something about that. Each CM 4 comes with foam plugs, called "bungs," that fit the tower's two ports. The instructions suggest how to plug one or both ports to roll off the bottom few octaves slightly (one bung) or a little more than slightly (two bungs).

With one bung in place, the sound in the male-voice/cello region opened up and relaxed noticeably, answering my only real gripe about the CM 4 pretty effectively without diminishing its response in the bass range. Two bungs were too much of a good thing, though, lightening the bass perceptibly. (The CM C and CM 2 each have one port and one bung, which I used throughout for the CM C but not for the surrounds.)

Speaking of bottom end, the CM 4's was very solid

and defined on typical pop/rock bass, as on tracks like "Driving Sideways" from Aimee Mann's Bachelor No. 2 (SuperEgo). They had ample dynamic finesse to reveal that otherwise well-recorded album's occasional mixing flaws in the bottom octaves. In short, on their own the towers' bass was plentiful enough for most music listening.

Moving on to multichannel sound, I cued up the Teldec DVD-Audio disc of the Beethoven Symphonies Nos. 4 and 5. The results were beguiling: rich and vibrant string sound, but also the three-dimensional "puff" around sharp transients (like the sudden accents in the Fourth's fourth movement) that you simply don't get from two-channel CDs — or from less extended and accurate speakers. Multichannel imaging was superb from the primary listening position, delivering a full, rolling hall-sound effect with uncanny realism.



A port plug opened up the CM 4's midrange — and Yo-Yo Ma's cello in Crouching Tiger, Hidden Dragon.

I did have one issue, however: the CM 4 towers are not magnetically shielded, so if I placed them much closer than about 3 feet to either side of my TV, they induced purpling in the screen corners. In most systems, normal speaker placement will be wide enough to avoid this problem. But in small rooms where widescreen TVs dictate close proximity, the CM 4 towers would not be a good choice.

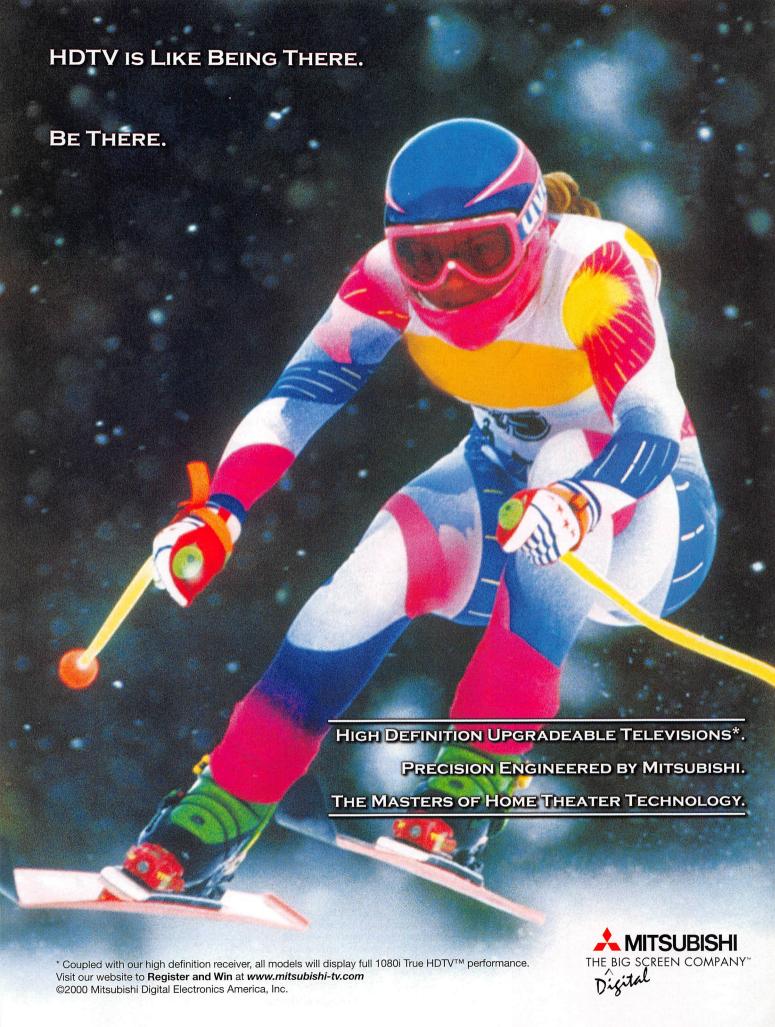
The CM 2 surrounds sounded fine on the Beethoven DVD-Audio disc and created a surprisingly cohesive sound field in movie scenes with a lot of ambient effects, like the rain-drenched cave sequence in Crouching Tiger. The B&W system produced richly balanced, musical sound for Tan Dun's swooping, surprisingly effective score, with the intensely beautiful tone of Ma's cello arching over all.

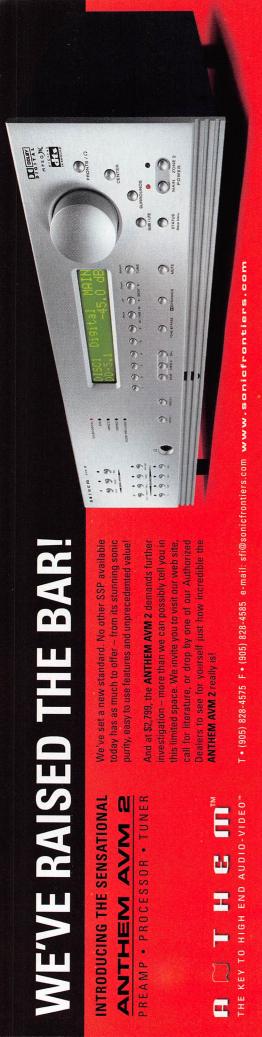
The CM C center was a close timbral match to the CM 4 and suffered less from off-axis tonal shifts than most other dualwoofer horizontal center speakers I've heard. That's probably because the CM C, like the CM 4, is a "2½-way" design. The lefthand woofer covers the bass and midrange, while the righthand woofer plays bass only. Consequently, there's less midrange response "lobing," which can change tone colors when you're seated a bit to one side. This is obviously the right way to design a horizontal center speaker. The only downside is that the sonic image seems to be a few inches off center relative to the TV screen — a small price to pay for a wide sweet spot.

I was equally impressed by the tiny ASW 2500, which delivered disproportionate extension and output. Its useful limit in my room at moderate home theater levels was somewhere well south of 25 Hz. I compared the ASW 2500 with my regular sub, a 12-inch design of far more conventional dimensions — and, coincidentally, also a

fast facts				
	CM 4 (L/R front)	CM C (center)	CM 2 (surround)	ASW 2500 (subwoofer)
TWEETER	1-inch dome	1-inch dome	1-inch dome	<u> </u>
MIDRANGE	6½-inch cone	two 5½-inch cones	6½-inch cone	 -
WOOFER	6½-inch cone		-	10-inch cone
ENCLOSURE	vented	vented	vented	sealed
POWER			<u>—</u>	700 watts
INPUTS/ OUTPUTS	biwirable binding posts	biwirable binding posts	biwirable binding posts	line-level inputs and outputs
DIMENSIONS (WxHxD)	7 ³ / ₄ x 35 ³ / ₄ x 11 ¹ / ₂ inches	18½ x 6½ x 9 inches	8 x 12 ⁷ / ₈ x 11 inches	12½ x 12¾ x 15¾ inches
WEIGHT	40 pounds	16½ pounds	183/4 pounds	50 pounds
FINISH	maple or rosenut wood veneer	maple or rosenut wood veneer	maple or rosenut wood veneer	black ash or cherry vinyl
PRICE Total: \$4,350	\$1,500 a pair	\$550	\$900 a pair	\$1,400

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test report

B&W model, though one long discontinued. I heard virtually no differences on music or movies up to and beyond my family-approved listening level. Pushed much higher — say, to sound levels of more than 95 dB at frequencies below 30 Hz — the ASW 2500 would produce an audible "fawlp" as its tiny driver reached full excursion on big bass transients.

I thoroughly enjoyed B&W's CM Series speaker system, and my only other quibble is over price. For \$4,350, you should *demand* full-range performance, spatial finesse, and musical refinement — all of which the CM suite delivers in spades, along with an airy depth that music listeners will find very appealing. You can get similar doses of all the above for less money — in some cases, hundreds less. However, from B&W you're also buying a system that plays honestly low and honestly loud, without requiring a subwoofer the

HIGH POINTS

Excellent musical and vocal balance.
Solid surround imaging.
Powerful bass from tiny subwoofer.
Extremely attractive styling and finish.

LOW POINTS

Front L/R tower speakers not magnetically shielded.
Subwoofer output audibly limited at very high volumes.
Pricey.

size of a central air-conditioning compressor. That still leaves a bit of a premium for its elegant finish, but the fact is, most families spend as many hours looking at silent speakers as listening to them. In that light, this fine-sounding, fine-looking system is tough to beat.

in the lab

THE GUENCT HESPONSE (at 2 meters)
front left/right32 Hz to 15.3 kHz ±6.0 dB
center78 Hz to 16 kHz ±4.4 dB
surround90 Hz to 14.8 kHz ±3.7 dB
subwoofer31 Hz to 120 Hz ±1.7 dB
SENSITIVITY (SPL at 1 meter with 2.8 volts of pink-noise input)
front left/right94 dB
center91 dB
surround91 dB
IMPEDANCE (minimum/nominal)
front left/right3.0/6 ohms
center3.2/6 ohms
surround3.1/6 ohms
PACC LIMITS (lowest frames and marries and

FREQUENCY RESPONSE (at 2 meters)

BASS LIMITS (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a

SPL with limit of 10% distortion at 2 meters in a large room) front left/right......25 Hz at 75 dB SPL

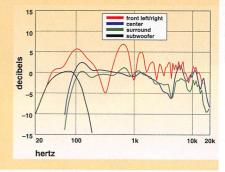
All of the response curves in the graph are weighted to reflect how sound typically arrives at a listener's ears with normal speaker placement. All the main speakers were measured with their ports open except as noted.

The CM 4 left/right front tower speaker had excellent bass output and remarkably uniform output overall within our ±30° listening window. It had the usual 300-Hz floor-reflection notch, a flat bass-to-treble balance, and quite a bit of roughness above 500 Hz. Plugging one port basically increased its output by 2 dB from 25 to 40 Hz and reduced it below 25 Hz by a like amount. With both plugged, the effect was 3 dB.

The CM C center speaker had a pronounced response notch at 3 kHz that deepened and fell

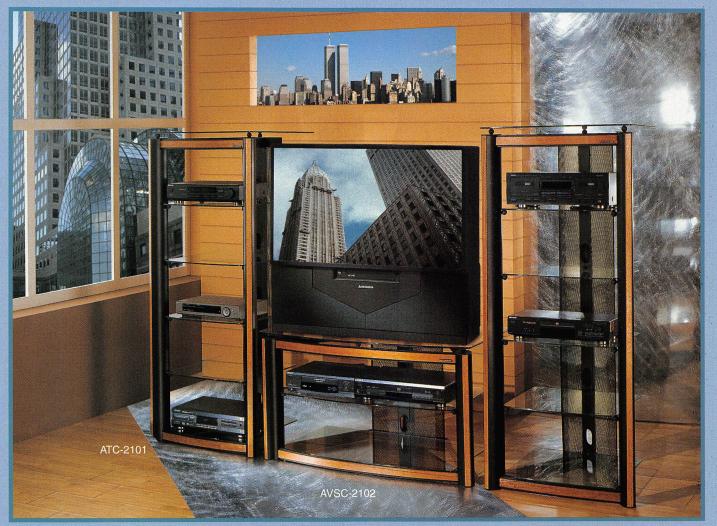
in frequency as the microphone was moved offaxis. Like its brothers, the CM C had good bass capability and excellent sensitivity, but its unusual impedance dip at 16 kHz might bother some older amplifiers. The CM 2 had excellent response at all listening angles, though a small notch at 4 kHz increased in severity at angles greater than 30°. The port plugs of both speakers had an effect similar to that with the CM 4 but 1 to 2 dB greater.

Bass limits for the ASW 2500 subwoofer were measured with it set to maximum bandwidth and placed in the optimal corner of a 7,500-cubic foot room. In a smaller room, users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL). The ASW 2500 had excellent extension for a tiny box. The measured crossover matched the dial markings closely at settings of 100 Hz and lower. There was only moderate interaction between the crossover and level controls with EQ A but about 8 dB top-to-bottom interaction with EQ B. At lower output levels, EQ B delivered about 4 dB more output below 30 Hz. Because the sub electronically limits its maximum output, the maximum SPL was identical for either EQ setting. — Tom Nousaine





HOME THEATER FURNITURE





The WU-2100 Home Theater System is undoubtedly one of the most exciting pieces recently introduced by Bell'O, elegantly combining metal and glass with a real wood trim -- another fine addition from the deCarolis Collection.

The strikingly beautiful audio tower (ATC-2101) is designed to accommodate at least ten audio/video components. The rounded glass shelves, which provide a truly custom look, immediately catch the eye. Measuring 25"w x 60"h x 24"d the ATC-2101 is truly a worthwhile addition to your home theater.

Creatively designed as a companion piece for the ATC-2101 or to stand alone, the AVSC-2102 is an excellent choice for up to a 40" Direct View TV and at least four components. Dimensions are 43"w x 23"h x 23"d.

The AVSC-2103, also a companion piece to the ATC-2101, accommodates up to a 40" Direct View TV and at least six components. Dimensions are 43"w x 30"h x 23"d.



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destination: Digital

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Monsoon

FPF-1000 Planar-Magnetic Speakers



ow a speaker looks means nothing if its sound doesn't live up to your expectations. But once you catch a glimpse of Monsoon's striking FPF-1000, you're going to want to take a listen. This is no black box but a sleek, flat, backward-leaning panel mounted above an attractive bass enclosure.

Canada-based Monsoon features planarmagnetic technology in its first home speakers, which include the FPF-1000 and two other full-size pairs designed for stereo listening or as the front left/right speakers of a home theater system. (Matching center

and surround speakers are in the works and should be available sometime this fall.) Instead of cones or domes, the diaphragms of FPF-1000's treble and midrange drivers are thin membranes etched with conducting elements and suspended between two magnets. Like all planar-magnetic drivers, they're dipoles, radiating sound both forward and backward at equal levels (but out of phase). And since most planar drivers can't move enough air to provide satisfying punch in the bass, they're combined with conventional cone woofers.

Sold in mirror-image pairs, the FPF-

1000 stands about shoulder high and is only 10 inches wide. The three planar-magnetic transducers and the two woofers are mounted on a laminated wood baffle, or "blade," that leans slightly backward. The tweeter panel is tucked between two midrange panels on the upper part of the blade, with all three offset toward the left or right side. The woofers are centered, one above the other, on the lower third. The blade is available either painted black (as shown) or finished in real walnut veneer. Given the beauty of either finish, you might want to forgo installing the matte-black perforatedmetal grille meant to cover all five drivers.

The baffle is supported by the bent MDF (medium-density fiberboard) bass enclosure, which is attached to a heavy aluminum stand that stabilizes the speaker and prevents it from tipping over. The stand also forms a sculpted triangular bass port, which looks much larger than usual for a vented speaker with modest-size woofers. Monsoon provides adjustable screw-in carpet spikes and adjustable rubber feet for hard floors.

I wired the speakers to a Threshold 150watt-per-channel Class A stereo amplifier and set them up in my capacious 30 x 17foot listening room. Its hardwood floor and many windows give it a "live," reverberant

fast facts

TWEETER 3 x 5-inch planar-magnetic

transducer

MIDRANGE two 4 x 8-inch planar-

magnetic transducers

WOOFER two 61/2-inch polypropylene cones

ENCLOSURE vented

INPUTS biwirable/biampable gold-plated binding posts

DIMENSIONS 10 x 52 x 121/2 inches

WEIGHT 43 pounds each

FINISH walnut veneer or matte-black baffle with black perforated-metal grille, black bass

PRICE \$1,199 a pair

MANUFACTURER Monsoon Audio, Sonigistix Corp., Dept. S&V, 11782

Hammersmith Way, Suite 201, Richmond, British Columbia V7A 5E3; 866-372-6357; www.monsoonaudio.com

test report

HIGH POINTS

Striking design. Superb imaging. Good accuracy, especially on vocals.

LOW POINTS

Sound quality is extremely placement dependent. Lack of ambience and sonic subtlety.

character. I've gotten superb results with both forward-radiating and bipolar speakers in this room (bipoles are like dipoles except they radiate front and back in phase instead of out of phase), but coaxing the Monsoon FPF-1000s to live up to expectations required considerable experimentation with placement.

It didn't help that the instruction manual begins, "Place your left and right speakers against the same wall facing your listening area." The Monsoon speakers are extraordinarily placement sensitive, and that one line in the manual could prevent listeners from discovering what they're capable of.

After many hours of moving the heavy speakers around, I found a congenial placement about 4½ feet from the wall behind them, 5 feet from the side walls, and about 6 feet from my listening position, toed in slightly toward it. In those positions, the sweet spot was fairly small, but the stereo image was flawless.

The Monsoon speakers rose to the challenge of a wide range of music, from basic vocal-and-guitar songs recorded in my radio studio, to elaborately produced pop recordings, to a variety of classical selections, including both string quartets and symphonies. They especially excelled at reproducing intimate recordings, such as the Oxford String Quartet's Beethoven cycle on Delos. The FPF-1000s put the chamber back into chamber music, creating a solid stereo image within an intimate soundstage between and behind the speakers.

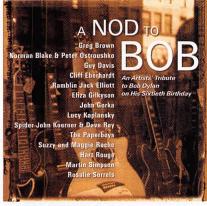
The Monsoon speakers treated voices with respect, accurately reproducing the natural timbre of vocalists without adding sibilance or chestiness. Indeed, they went so far as to smooth out any roughness or edginess present in the recording (that's not always a good thing). Female singers, such as the young Joni Mitchell, sounded particularly appealing. Listening to songs like "The Last Time I Saw Richard" from Blue, I felt as if she was there in the room

with me. It was also immediately obvious that she was playing an electric piano.

On "Boots of Spanish Leather" in the new Red House CD tribute to Bob Dylan, A Nod to Bob, Martin Simpson's vocals sounded as burnished and smooth as Spanish leather itself, his brilliant guitar playing as sweet as honey. And when he does his trademark snap on the strings, the Monsoons correctly handled the transient. Eliza Gilkyson's "Love Minus Zero/No Limit" on the same disc conveyed the gutsiness of her singing and the unusual color of her voice just as I've heard it live.

The Philips CD of Aaron Copland conducting his own Symphony No. 3 with the London Symphony Orchestra (originally on an Everest LP) sounded astounding on these speakers, proving they can do justice to a large ensemble. This is the symphony that incorporates Fanfare for the Common Man — enough to stress any speaker. The timpani, in particular, sounded forcefully authoritative, with superb definition. The Monsoon's well-damped woofers avoided overhang — when the skin of the drum stopped vibrating, so did the speakers.

In all cases the solid, full stereo image appeared behind the speakers. Studio albums with electric bass (most likely goosed in the recording/mixing process), sounded unbalanced, however, with slightly too much bass. My room's acoustical character probably contributed to this, although the



The Monsoon speakers rose to the challenge of a wide range of music, including this Dylan tribute CD.

effect isn't as noticeable with my reference speakers.

The most surprising characteristic of the FPF-1000 was an overall lack of ambience and airiness. A speaker with planar drivers should be able to respond to the subtlest of audio signals with complete transparency and sensitivity. But I heard very little room reverberation with many recordings, including some captured directly to CD-R in my very "live" radio studio. These sounded as if they'd been made in an acoustically dead space.

All in all, though, the Monsoon FPF-1000s provide a striking alternative in both sound and appearance to traditional boxshaped tower speakers. The dipole drivers create a remarkable stereo image, and the tall, slender panels create an arresting visual image.

in the lab

FREQUENCY RESPONSE (at 2 meters) 42 Hz to 15 kHz ±6.0 dB

SENSITIVITY (SPL at 1 meter with 2.8 volts of pink-noise input)......90 dB

IMPEDANCE (minimum/nominal).....2.7/3 ohms

BASS LIMITS (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room)......40 Hz at 92 dB SPL

The graph curve is weighted to reflect how sound arrives at a listener's ears over a ±30° window, with double weight given to the most typical listening angle, 30°. Because the FPF-1000 is a floor-standing speaker, primary measurements were taken with it sitting on the floor

The treble output fell off by 5 dB above 4 kHz and then plateaued until it fell rapidly above 15 kHz. The woofer/port system nicely managed the floor-bounce problem common to tower speakers (a notch at 300 Hz), but there was a buildup of energy between 1 and 3 kHz. Bass output remained strong to 40 Hz. The speaker is very directional, and output above 12 kHz was sharply attenuated by the time the microphone was moved 15° off-axis. Widening the measurement time window to include room reflections reinforced low-frequency output somewhat, but it didn't meaningfully alter the treble-shy tonal balance.

The FPF-1000's very low nominal impedance may be a problem for low-power or older amplifiers and receivers. On the other hand it measured an incredibly uniform 3 ohms above 400 Hz Tom Nousaine



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After 20 years of listening to music for a living, often for 12 hours a day, I find that my system has made listening to music fun again!"

Rick Rubin, The Absolute Sound, Issue #30



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test report by tom nousaine

Tannoy

PS 110 Corner Powered Subwoofer



he most common problem people have with a subwoofer is finding the best place to put it. I've mapped subwoofer response in just about every possible location in a dozen rooms, and in all but one (a loft with a sloped ceiling built into a large, two-story room), the optimal placement was a corner. Even in the exception, I got the best response with the sub only 2 feet from a corner.

There are good reasons why corner placement is almost always best for a subwoofer, having to do with the behavior of standing waves at bass frequencies, but a full explanation is outside the scope of this review. Suffice it to say that I thoroughly approve of the approach Scotland's Tannoy has taken with its PS 110 Corner powered subwoofer. It's designed to be tucked into a corner, on either the floor or the ceiling! In a corner on the floor, the sub is unobtrusive, with a footprint of less than 2 square feet. Mounted at the junction of walls and ceiling and painted or wallpapered to match, it could be practically invisible. What a great idea!

The downward-firing, bottom-vented PS 110 Corner is also available in a standard box enclosure (as the PS 110) or if you really want it to disappear, as the CMS110B and CMS110BC, which are designed to be mounted above a drop ceiling in the same space a 2 x 2-foot acoustical tile would normally occupy. Just remember that mounting any speaker on the ceiling, let alone a 47-pound subwoofer, is not a task for the inexperienced do-it-yourselfer.

When the PS 110 Corner is slipped into place, a 10-inch-wide, 6-inch-deep wedge of space remains clear for the AC power cord and signal wires, which go through a 2-inch circular hole in the back of the cabinet. The control panel, however, is not in the rear but hidden under the removable top, which snaps into place with stout clips that'll hold it firmly even with the sub mounted upside down on the ceiling.

The control panel has the usual input/ output connections and controls along with a knob labeled LF Tilt, which delivers 4 dB of boost below 60 Hz at the full-up setting. Well, I like lots of deep bass, and since the PS 110 Corner's response is relatively limited at either end of its operating range, I set the LF Tilt control to maximum boost for all my listening tests.

The Tannoy sub mated easily with my reference main speakers when its crossover control was set to its maximum position. Performance was essentially the same with the knob at 3 o'clock (settings are marked only at the two extremes, 40 Hz and 150 Hz), but high noon was a little too low. I found that the sub's output level fell by approximately 6 dB as I turned the crossover knob from its highest to its lowest setting, so I had to adjust the level as well. (Such control interactions are not uncommon.)

The PS 110 Corner did very well with jazz, rock music, and movie soundtracks that don't have ultra-low bass. But the true beauty of this sub is what it doesn't do when the program material is more de-

fast facts

KEY FEATURES

- 10-inch driver in sixth-order bass-reflex enclosure
- Amplifier rated at 110 watts rms
- Variable low-pass crossover (40 to 150 Hz)
- High-pass filter at 80 Hz, 12 dB/octave slopes
- 0/180° phase-control switch
- Low-frequency Tilt control

INPUTS/OUTPUTS gold-plated linelevel and speaker-level binding posts

DIMENSIONS 30 inches wide, 173/8 inches high, 181/2 inches deep

WEIGHT 47 pounds

FINISH black vinyl **PRICE** \$700

MANUFACTURER Tannoy, Dept. S&V, 335 Gage Ave., Kitchener, Ontario N2M 5E1; www.tannoy.com; 519-745-1158

HIGH POINTS

Designed for corner location.

Easily blends into décor.

Can be ceiling mounted.

Excellent limiting protection.

Reasonable price.

LOW POINTS

Limited bandwidth.

Modest output.

manding. For example, when the going got really, really low on Bass Connection's *Drivin' Bass* (Neurodisc), one of my regular subwoofer torture CDs, there was no sign of amplifier clipping, driver bottoming, or overload of any kind.

With my system's volume control set at 0 dB (Dolby level), the deepest bass tones in loud organ music and movie soundtracks were timbre shifted upward as the sub limited its output on the very lowest frequencies. The bass still sounded powerful, but its tonal balance was heavier in the middle and upper bass frequencies than in the deep bass. When I turned the volume control down to -15 dB or so, the proper spectral balance was more or less restored the lows in the program material sounded low. I like this "no sweat" approach to volume setting. I appreciate a sub that knows its limits and won't embarrass me when important people are listening.

For example, I popped *End of Days* into my DVD player and skipped to Chapter 18, where the church literally comes apart while you're in it. The PS 110 Corner gave

me all the thrill of the experience with just a little less pants flapping and floor shaking than I've gotten from the very best subwoofers. At moderate volumes, the sound was deep and full. When I turned the volume all the way up, nothing untoward happened except some timbre shifting as the sub's protection circuit kicked in. The subwoofer kept its cool even at 0 dB. Same deal on "Pure and Perfect Bass" from *Drivin' Bass*, where the sound swoops down to a house-rattling 12 Hz. The Tannoy sub couldn't play the lowest frequencies, but it did all it could and just ignored the rest.

Bass-reflex (vented) speakers often snort and pop when fed input signals that exceed their capabilities. Even those with good limiting sometimes allow a burst of noise through before the protection circuits clamp down. The PS 110 Corner's excellent level-overload performance can be attributed to an intelligently designed sixth-order bass-reflex enclosure (which tightly controls what exits from the port), very good high-pass filtering, and a very good limiting circuit.

I spent a nice long weekend enjoying a set of eight old jazz-rock albums from Terry Garthwaite, Joy of Cooking, and Tony Brown that had been transferred from LP to CD-R. With all of it, the PS 110's contribution to the sound was smooth and clean, providing bass enhancement without messing up my system's great imaging.

The Tannoy PS 110 Corner is a wonderful blend of architectural speaker and subwoofer. It has an interesting, functional shape, can easily be painted to match the walls (or ceiling!), and gives excellent performance for its size and price. Bravo!

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in the lab

FREQUENCY RESPONSE

(at 2 meters)......44 Hz to 96 Hz ±1.9 dB

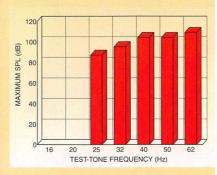
BASS LIMITS (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room)......25 Hz at 87 dB SPL 100 dB average SPL from 25 to 62 Hz 109.1 dB maximum SPL at 62 Hz

Bass limits for the PS 110 Corner subwoofer were measured with it set to maximum bandwidth and placed in the optimal corner of a 7,500-cubic foot room. In a smaller room users can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL).

Adjusting the crossover frequency knob from maximum to minimum also lowered the output level by about 6 dB. Although the control's upper limit is marked as 150 Hz, at full bandwidth the actual turnover frequency was 96 Hz.

At the 12 o'clock position, the frequency was 77 Hz, and at the marked 40-Hz lower limit, the frequency was 72 Hz. The LF Tilt control increased response by 4 dB below 60 Hz when set full clockwise.

— T.N



Made in Germany

(612)706-9255 Fax, www.cantonusa.com





quicktakes

CD to MP3 to ABC

Bose Wave/PC interactive music system

hen Dr. Amar Bose visited the magazine where I worked in the early 1990s, he teased staffers by hiding under a cloth the source of the luxurious-sounding music filling the room. Moments later he revealed that it was actually emanating from an unassuming clock radio. Since then, the Bose Wave radio has landed on countless tabletops and nightstands. Now, Bose has introduced a new version of the popular radio, called the Wave/PC.

In terms of appearance, the only difference seems to be a connector on the back to link the radio to the serial port and audio jack of a PC running Windows 98 or higher. The supplied cable is 15 feet long, so you don't have to put the Wave/PC right next to the computer. On closer inspection, however, you realize that the computer link and the software Bose supplies on a CD-ROM expand the capabilities of the Wave/ PC far beyond those of its stand-alone forerunner. (An accessory is expected in October that will let you use your computer's USB port either just for controlling the Wave/PC or for bypassing your computer's sound card entirely. Its price hadn't been announced as we went to press.)

The Wave/PC is meant to provide quick, easy access to all the MP3 and WAV music files on your computer's hard drive, to music on a CD, and to a multitude of Internet radio stations without your having to sit in front of the computer. And when the computer is turned off, you can still use the Wave/PC as an AM/FM radio or its speakers to play an external audio source. Like

its predecessor, it has two wakeup times and a snooze button, and it comes with an antenna, a 9-volt battery for clock/alarm backup, and a neat credit-card-size remote control.

Setting up the hardware took me less than 10 minutes. I inserted a tiny battery in the remote and the 9-volt battery in the Wave/PC, attached and strung the antenna, and connected the cable to my computer. The unit's beige exterior (it's also available in charcoal) matched my PC to a T. You'll need about 200 megabytes (MB) of hard-disk space to accommodate the Wave/PC software, which includes a classical-music sampler compressed in the MP3 format at a classy 192 kilobits per second (kbps) — 128 kbps is the de facto standard.

After you install the Bose software on your hard drive, it automatically scans for MP3 and WAV files for inclusion in a general playlist. It found 129 MP3 tracks on my PC but ignored music files encoded in other formats, like Windows Media Audio. The software also installs a list of your local radio stations from a national database



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—Joe Hageman, Home Theater Magazine

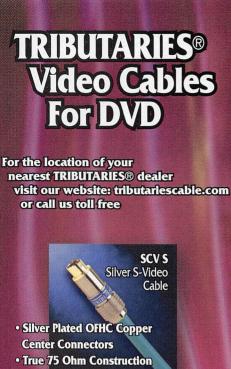
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—Jeff Cherun, Home Theater Magazine

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and Unmistakably
the Best of the Day"

Home Theater Magazine November 199



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quicktakes

on the CD-ROM and scans the airwaves to gauge signal strength. Seeing all the stations' frequencies and call letters in my area listed on the PC screen, including icons indicating strong reception, made the setup process a snap. Click on a frequency, and the Wave/PC tunes it in. And the clock is automatically set by the computer.

The ease of using the Wave/PC became even more apparent when I set the system's presets. As on the original Wave radio, a sextet of buttons atop the Wave/PC can instantly call up six AM and six FM stations, but now you can assign them by dragging the call letters from the station list to the soft buttons onscreen. The Wave/PC also lets you assign each of the presets to an individual song or whole playlist of songs on your computer's hard drive as well as to a Web radio station. And with the infrared remote, you can use the presets from up to 20 feet away, toggling seamlessly between traditional radio, Web radio, and stored music by tapping buttons.

Another cool feature of the Wave/PC is that the Bose software downloads the song titles for a CD the first time you insert it in your computer's CD-ROM drive by automatically logging onto Gracenote's compact disc database Web site (www.cddb .com). You can then use Bose's integrated MP3 encoder — or ripper — to turn the whole album, or selected tracks from it, into MP3 files stored on the hard drive. This is the first encoder I've used in which the default data rate is 192 kbps, though you can also choose 64, 128, or 160 kbps as well as 256 or 320 kbps. To play a CD burned with MP3 files, you must add your computer's CD-ROM drive to the available sources from the setup menu.

To enjoy Web radio, you'll need an active Internet connection — the faster, the better. You can set the Bose software to automatically load your browser and connect whenever you switch to Web radio mode. This even works with America Online's dial-up service, though I typically had to wait a few minutes for the first station to be heard. You *can't* set the alarm to wake up to Web radio, but given the occasional flakiness of the Net, that's probably a good thing.

Truth be told, when I sat down to load up the presets, I was thwarted from locking in KFOG, a favorite San Francisco radio station. The Bose software recognizes only the RealAudio format used by most Webcasters. But KFOG embeds its bitstream in

a Yahoo! player format that isn't compatible with the Bose software. Nonetheless, there were plenty of other choices to fill the presets, including an on-demand newscast from the ABC Radio Network, London's BBC Radio 4, and a National Public Radio station in Texas that carried a performance of the Boston Symphony from Symphony Hall when my local affiliate did not.

Bose should be commended for including an easy-to-understand manual with crisp illustrations, a glossary and index, and — something rare these days — an 800 number for support. During the course of a week, all of my calls were answered promptly and knowledgeably by human beings. What a novelty!

Keep in mind that if you're thinking of installing the Wave/PC but are already using external speakers with your computer, you'll have to disconnect them. In my case, I moved out a rather clunky pair of desktop towers and an under-the-desk subwoofer. I don't miss them. At $14 \times 4^{3}/_{16} \times 8^{1}/_{4}$ inches, the $6^{3}/_{4}$ -pound Wave/PC occupies only a corner of my desk, but it gives me all the sound I was used to. And, like the original Wave radio, the Wave/PC gives you an amazing amount of bass for its size.

Thanks to one of the idiosyncrasies of dial-up connections I couldn't help but marvel at the difference between mono and stereo on the Wave/PC. When a streaming-radio source's bit rate fell too low for stereo, it unceremoniously switched to mono. When it returned to stereo, the audible difference was startling — I felt enveloped in sound, not just oriented to a single source.

Bose hasn't put the radio's own readout to much new use, except to flash "PC" when you're booting up the computer. That's too bad, because it would be nice if song titles crawled across its face. It's also too bad you can't run the software under Windows 95, since earlier PCs have the necessary serial ports. Still, I'm not complaining. Since an easy-to-use database manager is integrated into the software, switching between over-the-air and Web radio, a CD, or a library of MP3 songs is like twisting your own custom music dial. As computers are used more and more to deliver audio from a variety of sources, the Bose Wave/PC is primed to bring out your PC's musical talents. And it's an excellent alarm clock, too. - Michael Antonoff

Bose, Dept. S&V, The Mountain, Framingham, MA 01701; wavepc.bose.com; 800-999-2673

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quicktakes

The Missing Link Turtle Beach AudioTron network music player

ometimes new technology is a logical extension of the old. For example, DVD-Audio is essentially CD on steroids. But sometimes a new product is harder to understand because it fails to fit existing paradigms. The AudioTron is one of the latter — its product category didn't even exist a year ago, and we're still not completely sure what to call it.

The Turtle Beach AudioTron is a \$300 computer peripheral that connects to a Windows PC over an Ethernet 10BaseT or HomePNA 2.0 network. (HomePNA networks use ordinary home telephone lines to distribute signals, but without interrupting other phone services.) The AudioTron can access music files stored on the PC in the MP3 or WMA (Windows Media Audio) formats, and with the Ethernet setup it can also handle uncompressed .wav files. It converts whatever digital music files you select to standard digital or analog audio signals and sends these to a stereo or A/V receiver for playback over speakers. (It also has a 1/4-inch headphone jack.)

In effect, the AudioTron gives you remote control for playback of digital audio files stored on your PC, which becomes a kind of music database that can be accessed from wherever the AudioTron is located. For example, if you had a thousand MP3 files on the hard drive of the PC in your home office, you could use an AudioTron in your A/V rack to play them over your home theater or stereo system. Multiple AudioTrons networked to the same PC can access different files simultaneously, or one AudioTron can connect to multiple PCs on the same network.

The AudioTron's metal chassis measures 17 x 8½ x 2½ inches, and it weighs 5 pounds. A good part of the box is empty, but the 17-inch width makes it easy to drop the AudioTron into a stack of A/V components. Its front panel has some controls that are familiar — power, stop, play, pause, forward/reverse scan and skip, volume (for the headphone output), Shuffle (for random playback), and Loop (for repeat play-

back) — and some that aren't, including Options, Group Add/Delete, and a rotary selector. The latter let you create customized playlists and search for songs by title, artist, album, or genre.

The Windows CE operating system can handle a database of up to 10,000 song titles. A backlit 40-character, two-line alphanumeric display provides a readout of menu items as well as album and song titles (if these are contained in the file). The remote control duplicates front-panel buttons and adds some features, such as Favorite buttons to play preselected groups of songs. On the rear of the chassis are analog stereo RCA outputs, an optical digital output (at 32, 44.1, and 48 kHz), an Ethernet RJ-45 socket, and two RJ-11 sockets for phone-line connections if you use a Home-PNA network.

For my test, I plopped the AudioTron near a stereo playback system, connected its digital output to my receiver, and jacked it into my network port using a supplied cable. Turning to my Win98 PC, I moved some high-quality MP3 and WMA files, which I'd ripped previously, to the directories where the AudioTron looks for them and powered it up. First it searched for the network and hosts. If the network has a DHCP (Dynamic Host Control Protocol) server, this should be an automatic process. Mine doesn't, so some pain and suffering were required to properly configure the device's IP address. Eventually, the Audio-Tron found the host and I was able to play music files from my PC.

How did they sound? Terrific. The MP3 and WMA files I selected had been encoded at 192 kilobits per second, which means that on the AudioTron they sounded indis-

tinguishable to me from the original CDs. The big improvement, of course, is that instead of hearing them through my lowly PC speakers, I could indulge myself with much better stereo system playback. I played song after song and never had a problem. There was traffic on my network, but the AudioTron has enough onboard buffer memory for uninterrupted playback even through several seconds of network congestion. In short, setup was reasonable, and the operation and sound were great.

I also installed the supplied AudioStation 4.0 shareware, which captures, manages, plays, and outputs music files. But the AudioTron isn't dependent on this software and also plays files created by other digital jukeboxes. In fact, it doesn't require you to run any fancy host software on your computer.

I wasn't able to listen to files streaming from the Web via the PC's browser with the review sample, but that feature has since been made available as part of a downloadable firmware upgrade. The AudioTron is also available from Gateway Computer at a similar price, but with a somewhat different software bundle, as the Gateway Connected Music Player.

Without a doubt, devices like the AudioTron have a bright future. They neatly merge the computer's strengths of Web access, CD ripping, and mass storage with a stereo system's high-quality playback. The result is a convenient way to listen to music. If your computer already houses a music collection, or if you're inclined to copy your favorite CDs to your hard drive, the AudioTron will channel it all to your home theater. Rather than messing with mice or sorting through jewel boxes looking for music, you can settle into your futon with a remote and simply start listening.

- Ken C. Pohlmann

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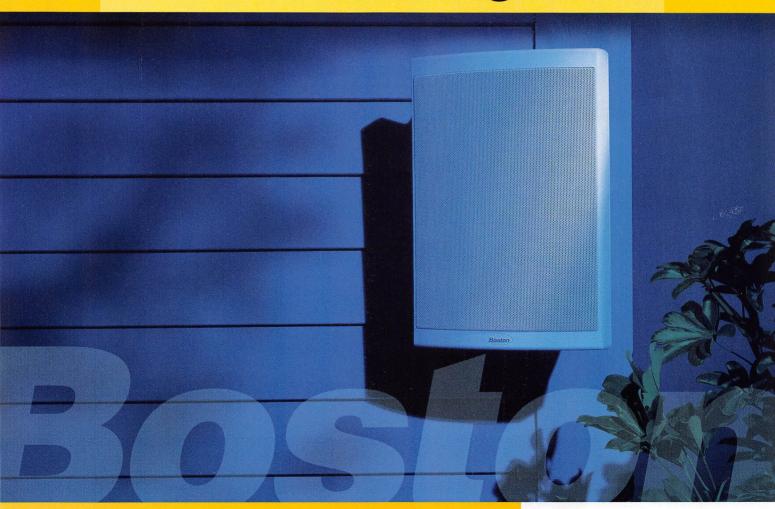


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Anatomy of a Speaker System

What you need to know to select the right surround sound setup

by Daniel Kumin



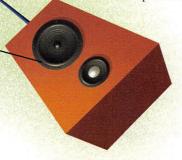
The left and right surround speakers primarily deliver ambience — the spatial cues, such as echoes or delayed sounds, that suggest the acoustical space where the action is taking place. But they can also be used to reproduce voices and instruments in multichannel music mixes.

ho hasn't heard of DVD by now? But a lot of people who've bought DVD players are finding that the speakers in their TVs, or even their tried-and-true stereo pair, just can't cut it when it comes to the room-rumbling, sonic-spectacular soundtracks of DVD movies. For the uninitiated, though, buying and setting up the six or more speakers necessary for true 5.1- or 6.1channel playback can be intimidating. Or maybe you've cobbled together a decent enough surround sound setup but still feel you're missing something, especially when you listen to the latest Dolby Digital movie soundtracks or pop in one of the new DVD-Audio or Super Audio CD music discs. Whether you're looking for a suite of home theater speakers to complement a new DVD player or HDTV, considering a surround sound upgrade to your stereo system, or just want to scrap the el cheapo surround system you bought at the local megastore for something better, you should take the time to become familiar with what goes into a first-rate multichannel speaker system - piece by piece.

Count 'Em Up

How many speakers do you need for movie theater-like surround sound? The most common setup consists of six speakers in a 5.1-channel configuration, with left, center, and right speakers in front, left and right surround speakers (often erroneously referred to as "rear" speakers) placed to the sides of the listening area, or a little behind it, and a subwoofer along the front wall or in a corner for the bass-only ".1" or LFE (low-frequency effects) channel.

If six speakers sounds like too many, there are a few options to consider. You could decide not to use a center speaker at all, opting instead for a "phantom"





The front left and right speakers in a surround sound system can either be towers (left) capable of reproducing the full range of movie and musical sound, or compact satellites (right) that reproduce everything but the bass, which is routed to a subwoofer.

center image. (This is the same technique that's used to create images in the center of the soundstage for stereo listening, where the signal for a centered voice, instrument, or sound effect is divvied up between the left/right speakers to create the illusion that it's coming from between them.) But you'll pay a price in sonic accuracy and solidity of imaging, as only those listeners seated right in the middle will hear sound that seems to come from the center position. And you might not need a subwoofer if your front L/R speakers can produce plenty of deep bass - but you'd be sacrificing the placement flexbility that might be necessary to get the best bass performance in your room.

You can even get simulated surround sound using just a stereo pair of speakers thanks to the various brands of virtual surround processing offered in many DVD players and some home theater receivers. This processing can create an impressive illusion, but it relies on the listener sitting in a relatively small "sweet" spot. The bottom line is that you really do need at least five main speakers, and probably a subwoofer as well, if you want to experience movietheater-like surround sound.

Left and Right Wings

Many people build their home theater systems around the pair of speakers they've been using for stereo listening, simply moving them to either side of a TV and adding new speakers as their budgets allow. This approach can save you some money (although there are fine systems available at just about every price level), and you'll be starting with a pair of speakers you're already familiar with and (presumably) like. But you might have a tough time matching the timbres, or tonal characteristics, of new speakers with those of your stereo pair, even if they're from the same manufacturer. So shopping for a whole new system could give you an opportunity for a significant upgrade in sound.

Since you'll probably be using your system for listening to music as well as movies — and will be doing a lot of your listening in stereo rather than surround mode - make sure your front left/right speakers can carry the ball alone when they have to. They should sound smooth, accurate, and dynamic and be able to play loud without distortion. Getting the best possible sound here will pay off for movies, too, since the front left and right channels convey most of the music and effects in a typical movie soundtrack.

Meeting these demands would be no big deal if you had unlimited money and space to work with, since there are many excellent floor-standing speakers. Because many of these speakers can give you solid bass down to 35 Hz or lower, you could even do without a subwoofer to handle the low-frequency load - although you'll usually get deeper, more dynamic bass with a good, extended sub than without.

There's also a class of floor-standing speakers, dubbed "power towers," that have subwoofers on board. You won't have to worry about blending the upper end of a separate sub's range with the lower end of the main speakers, because these speakers' sub sections are designed at the factory to complement the nonpowered parts. Power towers have amplifiers built in and their own volume controls. Of course, that means each speaker must be plugged into an electrical outlet.

Power towers can deliver full-range, dynamically powerful performance, but they tend to be big - and expensive. While two towers may be more appealing than two towers plus a sub, the locations that deliver the best stereo imaging aren't necessarily best for reproducing the lowest bass.

If big, floor-standing speakers just won't work in your room, there are plenty of small, high-quality speakers you can put on shelves or stands instead. Not only can small "satellite" speakers give you all of the sound of floor-standing models - once they're wedded to a good subwoofer, that is - but they're also famously décor-friendly, providing a welcome solution to the problem of recreating movie theater sound while maintaining domestic tranquility.

But steer clear of bargain-basement micro or mini speakers that are simply too small and poorly made to do the job. Their dinky drivers can't produce enough sound to fill an average living room, and the breadbox-size "subwoofers" usually included with these systems can't come within a time zone of genuine deep bass.

That said, there are plenty of compact satellite/subwoofer systems that can produce jaw-droppingly good sound. To do that, though, the satellites need to deliver smooth, accurate sound from about 100 Hz on up. And they need to have enough dynamic ability - and power-handling capacity — to play loud, without distortion, in order to deliver the full impact of an action-packed movie soundtrack like Gladiator or The Matrix, or an enveloping multichannel recording like Steely Dan's Two Against Nature on DVD-Audio or James Taylor's Hourglass on Super Audio CD. The subwoofer, for its part, has to reach high enough into the lower midrange so it blends with the satellites without distortion or a gap in response, while also being able to go low enough into the deep bass for real, visceral impact.

Front and Center

Because it has to reproduce almost all of the dialogue in any movie soundtrack, your system's movie performance will pretty much rise or fall depending on the performance of the center-channel speaker. But the center speaker's duties don't end with dialogue. It also has to deliver important portions of the music, sound effects, and even spatial cues. ("Space" doesn't happen only in the back!) And in the new world of DVD-Audio and SACD multichannel music. where the lead vocalist or instrument can be isolated in the center channel, this speaker frequently anchors the entire mix.

The center speaker has to be able to reproduce the range of human speech as well as all musical sound except for deep bass, which can be routed to full-range left/right speakers or to a subwoofer. A tiny center speaker may even have a hard time with the voices of characters like Darth Vader. A sub can pick up some of the slack on deeper voices, but not all, and depending on placement and blending, it might not be able to equal the performance of a broaderrange center speaker.

The ideal solution is to use identical speakers for the left, center, and right front positions. But the biggest problem with using a full-range, vertically oriented speaker for the center channel is that it interferes with the TV screen, or vice versa. The usual compromise is a speaker that you can either rest on top of your TV or on a shelf above or below it.

Most center speakers have their drivers laid out horizontally, with two small woofers flanking a single tweeter. This makes it easy to place the speaker smack dab in the center of the screen image, where it belongs. (You'd be surprised, though, how many center-channel speakers get placed to one side or the other. Duh!) The main drawback of this design is that voices and music can sound colored (instead of accurately reproduced) for anyone listening well off to the side. This isn't a problem, however, if everybody is seated pretty much directly in front of the TV.

The best way to maintain consistent center-channel sound throughout the listening room is to combine a vertically arrayed tweeter and midrange complement with woofers on either side. But many of these models are too big and heavy for set-top placement in some folks' systems.

Don't skimp when it comes to the center speaker. Go for the fullest possible frequency range - at least deep enough to cover the entire range of male voices accurately. And mount the speaker so it's even with the front of the TV screen, or maybe sticking out an inch, not behind it. Mounting it on a shelf or wall behind the TV might make dialogue and center-channel sound effects seem to come from behind the action onscreen.

The Outback

Probably the most misunderstood members of the speaker brigade are the surrounds, and much of the confusion arises from their multifaceted role. With movie soundtracks, the surround speakers primarily deliver ambience — the spatial cues, such as echoes or delayed sounds, that sugpointed at the listening position, with the drivers typically firing toward the front and back of the room. (Models that have only one woofer and dual tweeters may aim the woofer at the listening position.)

With direct radiators, most of whose sound reaches listeners directly, the speaker's location is relatively easy to identify, and detail and clarity tend to be good. Both of these traits are desirable for those multichannel music mixes that place instruments or voices in the surrounds. By contrast, a dipole surround sends most of its midrange and treble radiation away from the listeners, who hear it only after it's been reflected from the room boundaries.

A good home theater speaker system should deliver both the full impact of action movies and the enveloping sound of multichannel music.

gest the acoustical space where the action is taking place. But they must also reproduce critical sounds such as offscreen explosions, overhead airplane and helicopter flybys, front-to-back rushing sounds in subway scenes, and a thousand and one similar effects. Soundtracks often call upon the surrounds to reproduce music as well. And many of the new DVD-Audio and SACD multichannel recordings require one or both surrounds to reproduce the full range of instruments and voices.

Manufacturers use three basic designs to address these somewhat schizoid demands. Direct radiators, or monopoles, are the kind of speakers most often used for the front left/right channels. In fact, many systems use the same speaker model for both

the front and surround L/R positions. Dipoles have two sets of drivers in each speaker, or at least two tweeters, facing in opposite directions and radiating out of phase. Bipoles are similar to dipoles except that the drivers radiate in phase. Direct radiators are aimed at the listening positon, usually from positions slightly behind and to the sides. Dipole and bipole surrounds, on the other hand, are positioned so the face of the cabinet with no drivers on it is

This enhances the sense of ambience and keeps you from "localizing" the speaker which is usually the best way to go with movies, where attention should stay focused on the screen. Bipole speakers tend to spread sound more evenly than either of the other types, and when used as surrounds their tonal accuracy and localization tendencies are about midway between dipoles and monopoles.

Some manufacturers have introduced designs that incorporate both dipole and direct-radiating drivers. You can manually switch between the operating modes based on the type of program material you're listening to. Another solution is offered by a handful of receivers that let you switch between two sets of surround speakers







Dipole or bipole surround speakers (top) are placed with the drivers firing forward and backward, while direct-radiating surrounds (bottom) may be aimed toward the listening position.

so you can have one set optimized for direct-radiating playback and another for dipole or bipole playback.

The general rules of thumb for which kind of surrounds work best in which situations are only rough guides — try to audition each type in as many situations as you can before making a decision. It's a tough call, in part because room acoustics and setup geometry can have a big effect on how each kind of speaker sounds.

The question of which design works best still pertains if you decide to go with a 6.1-channel Dolby Surround EX/DTS-ES system, which uses one or two additional "back surround" speakers centered behind the listening position. I've had great success with a single bipole back surround speaker placed in the middle of the rear wall. But the size of your room, its acoustics, and your listening preferences could lead you to add a second back surround or to go with a monopole or dipole.

The Low Country

Subwoofers are designed to do nothing but reproduce deep bass. In the most common setup, small, limited-range satellite speakers are used for all of the main channels, and the subwoofer handles all of the bass. Selecting "small" for the satellites in your receiver's bass-management setup menu will route all of the deep bass to the sub. If you have full-range speakers all around (not very common), you'd select "large" for the satellites, and the sub would fill in the very bottom of the range only with whatever signal the program source assigns to the ".1" or LFE channel. In most big action movies, the LFE carries the very deep rumbles of explosions and whatever other sonic mayhem is present. For a system that has full-range speakers in the left and right front positions and smaller center and surround speakers, you'd select "large" for the front L/R channels and "small" for the rest.

One critical piece of shopping advice: don't confuse a bass module with a subwoofer. Lots of home theater systems that have five satellite

minispeakers include "subwoofers" that can't reproduce deep bass — frequencies below, say, 50 Hz. A real *sub*woofer will provide solid, convincing bass down to at least 35 Hz and preferably close to 20 Hz (or even below that). Bass modules aren't necessarily bad, but they can't give you the full impact of action-movie soundtracks, pipe organs, synth-pop, and the like.

Because many mini-satellite systems depend on the bass module, "sub," or whatever you call it for most of their not-so-deep bass as well, it has to play high enough and smooth enough to blend effectively with the satellites' lower end. But the small cabinets and drivers used in these systems can lead to satellites that can't play low enough and subs that can't play high enough, resulting in a noticeable gap in the sound.

If your main speakers can effectively reproduce, say, 40 Hz, it's probably not worth buying a sub that goes down only to 32 Hz. You'd be better off saving up for a larger, more powerful sub that can kick out bass in the ultimow, room-shaking 20-Hz region.

Sure, we'd all prefer to have a

subwoofer the size of a hatbox, but if you want powerful deep bass, bigger is almost always better. Other things being equal, a sub with a 12-inch driver will play lower, louder, and cleaner than one with a 10-incher, and so on. While there are several ultra-compact subwoofers that nearly subvert the laws of physics by moving a smaller cone a greater distance in and out (which takes *lots* of amplifier power), these models tend to be much more expensive than conventional subs.

Positioning a subwoofer can be trickier than positioning the five satellite speakers. While it's difficult to tell from a sub's lowest frequencies where it's placed, the upper-range output can betray its location, especially if the setup requires it to play up into the 150- to 200-kHz region. Subs are usually placed along the same wall as the front L/R satellites, often close to one of the corners.

ultichannel speaker setups come in all shapes and sizes, and at a variety of prices, so don't ever assume you don't have the money or space for the kind of sound you want. I've heard terrific systems of every stripe: tiny matched satellites with a single subwoofer, a motley combination of direct radiators and dipoles with a bipole back surround speaker and as many as three subwoofers, power-tower setups with no subs, and virtually every configuration in between. Not every setup will work in every room, but there's probably at least one arrangement that will do the job in even the wackiest space.

With home theater speaker systems, thinking "outside the lines" is often rewarded, so don't be afraid to experiment. There are a lot of options, but if you focus on the distinct role of each speaker in a home theater system — and where it needs to be placed to fulfill that role — then spend the time to do some serious listening, there's no reason you can't find a system that's just right for you.

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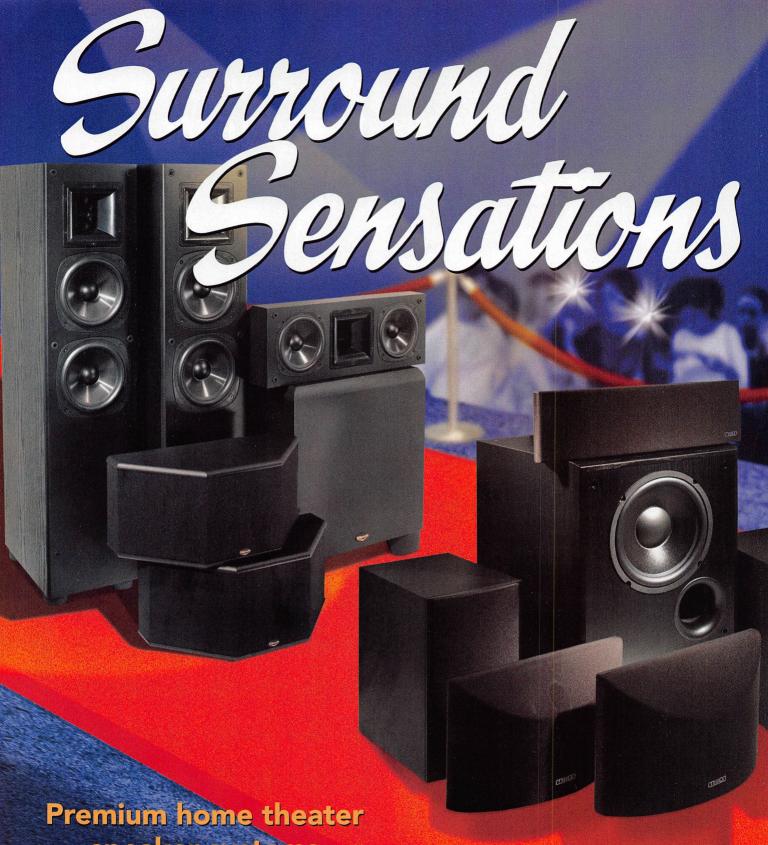
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Premium home theater speaker systems from Infinity, Klipsch, and Mission strut their stuff by Ken C. Pohlmann

ome theater has been the best gift to audio manufacturers since Edison yelled into a horn. All of a sudden two-channel stereo systems are woefully old-fashioned. Speaker manufacturers especially have much to be thankful for — instead of two speakers per system, now they can sell at least six. What a deal!

Of course, opportunity breeds competition, and competition breeds combat. Every manufacturer, anxious to conquer as much of the enemy's homeland as possible, is furiously designing new speakers to capture surround sound customers. As a result, the marketplace is teeming with excellent home theater speakers. To help narrow down the possibilities, we selected complete higher-end systems from three highly regarded speaker brands: Infinity's Modulus

system (\$1,699), a mix-and-match grouping from Klipsch's Synergy series (\$1,829), and a suite from Mission's m70 series (\$1,850). Each brand's engineers used very different design tactics to achieve similar goals. It was my job to determine how each system fared.

Infinity Modulus

The Modulus system is literally a home theater speaker system in a box. All six speakers, plus a room-optimization kit, are tucked into one carton scarcely bigger than those for the other two systems' subwoofers. The five two-way satellite speakers are about as different from a typical box speaker as you can get. They're strikingly small and sport a beautiful, award-winning industrial design.

All five magnetically shielded satellites

are sculpted from a charcoal- or plantinum-colored plastic with a pleasingly soft, rubbery feel and have grille cloths surrounded by brushed-aluminum frames. The four MS-1 left/right satellites are attached to stands, also faced with brushed aluminum, that let you sit the speakers on shelves or mount them on a wall (using supplied wall brackets). A ball-and-socket connection gives a free range of motion.

The MCC-1 center speaker, curved across the top, is equally pleasing visually. To simplify installation, Infinity offers an optional bracket that lies across the top of your TV set (underneath the center speaker's sturdy rubber feet) and lets you hang the left/right front satellites on either side; it fits sets from 30 to 55 inches. The center speaker uses the same drivers as the other satellites but has two midrange cones.



It's hard to make a squarish box look cool, but the Modulus MSW-1 subwoofer, finished in the same platinum or charcoal plastic used for the satellites, is one of the most stylish I've seen. The front holds a 12-inch driver, vented on the bottom of the cabinet, and a output-level knob on one corner. The input/output panel on the rear has switches to select line-level or speakerlevel connections and 0 or 180° phase as well as on/off switches for power, the fixed (100-Hz) low-pass filter, and the RABOS (Room Adaptive Bass Optimization System) single-band parametric equalizer.

The RABOS kit includes a sound-level meter, a screwdriver, measuring templates,



KLIPSCH SYNERGY SF-2 SYSTEM

	SF-2 (front L/R)	SC-1 (center)	SS-1 (surround)	KSW-12 (subwoofer)
TWEETER	1-inch horn- loaded dome	1-inch horn- loaded dome	two 1-inch horn- loaded domes	_
WOOFER	two 61/2-inch cones	two 51/4-inch cones	51/4-inch cone	12-inch cone
ENCLOSURE	vented	sealed	sealed	vented
POWER	-	<u> </u>	-	440 watts
DIMENSIONS (WxHxD)	8 x 35 x 13½ inches	18 x 6½ x 7½ inches	15 x 63/4 x 6 inches	15 x 17 x 15 inches
WEIGHT	38 pounds	15 pounds	8½ pounds	35 pounds
FINISH	black ash veneer	black vinyl	black or white vinyl	black vinyl
PRICE Total: \$1,829	\$650 a pair	\$280	\$400 a pair	\$499

IANUFACTURER Klipsch, Dept. S&V, 3502 Woodview Trace, Suite 200, Indianapolis, IN 46268; www.klipsch.com; 800-554-7724

and a test-tone CD. These help you measure the sub's acoustic output in your room, then calculate the right frequency, level, and filter-width ("Q") equalizer settings to optimize its performance. You use the screwdriver to dial in the settings on three recessed potentiometers.

Klipsch Synergy SF-2

The system we assembled from speakers in Klipsch's Synergy series to some extent reflects the "bigger is better" approach this venerable brand was once known for. No bookshelf-size front left/right satellites here — this system sports floor-standing, waist-high SF-2 towers with traditional medium-density-fiberboard (MDF), bassreflex cabinets and black cloth grilles. The speaker has a proprietary horn-loaded Tractrix tweeter, two woofers, and a rear port.

The SC-1 center speaker is also fairly

conventional looking, though one of the rear corners is angled so the speaker can sit below a screen and be aimed upward. The sealed MDF cabinet houses the same tweeter as the SF-2, but there are two smaller woofers, arrayed symmetrically on either side of it. The SS-1 surround satellite, designed for wall mounting, has a sealed MDF cabinet with drivers deployed across three angled faces. Two contain Tractrix tweeters, radiating 90° apart, and the center face, which is aimed at the listeners, has the same small woofer as the SC-1.

The KSW-12 powered subwoofer has a black MDF bass-reflex cabinet raised on tall feet because its 12-inch driver fires downward (its port is in the rear). The speakerlevel outputs are high-pass filtered at 100 Hz, with 6-dB-per-octave slopes. The sub's low-pass filter is continuously variable from 40 to 120 Hz, with a 24-dB-per-octave slope above 120 Hz. Phase is reversible, and there's an output-level control and a power switch.

Mission m70 Series

From Mission's new m70 series, we assembled a system starting with the m72, a classic bookshelf speaker with a vented cabinet and a black cloth grille. The woofer and tweeter are both mounted in a single hard plastic casing that's secured to the cabinet with six screws. The rear of the MDF cabinet has the woofer port and four binding posts (so they can be biamplified).

The m7c1 center speaker has a black, molded-plastic cabinet whose rounded edges are meant to flow unobtrusively into the top of a TV set. Its black grille cloth conceals a tweeter, two midrange drivers, and two ports, all horizontally and symmetrically arrayed.

The m7ds bipole surround speaker is

INF	YTIN	MOD	ULUS

	MS-1 (L/R satellites)	MCC-1 (center)	MSW-1 (subwoofer)
TWEETER	3/4-inch dome	3/4-inch dome	_
MIDRANGE	4-inch cone	two 4-inch cones	
WOOFER			12-inch cone
ENCLOSURE	sealed	sealed	vented
POWER			300 watts
DIMENSIONS (WxHxD)	5½ x 11 x 4½ inches	20 ³ / ₄ x 6 ¹ / ₄ x 4 ¹ / ₂ inches	14½ x 16½ x 19¼ inches
WEIGHT	5 pounds	8 pounds	42 pounds
FINISH	charcoal or platinum plastic	charcoal or platinum plastic	charcoal or platinum plastic
PRICE System total: \$1,699	\$349 a pair	not sold separately	not sold separately

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more radical in design. The thin, black, molded-plastic cabinet has a flat back and a bulging front. Although it's stable enough to be placed on a shelf, it's more at home mounted on a wall. The grille cloth curving across the front conceals two angled faces - each holding a tweeter and a midrange driver — radiating in phase. There's a small port between the two faces.

The 700ASi subwoofer is a straightahead design with a 10-inch driver and a tuned port on the front behind a removable grille cloth. Knobs on the rear adjust output level and crossover frequency (from 50 to 150 Hz). A switch selects 0 or 180° phase, and another bypasses the crossover.

Setting Up

Prior to listening, I spent a little time getting used to each system. Good thing most of the speakers were shielded — otherwise the combined flux field of their magnets would have scrambled my brain and made

me start repeating things start repeating things. Anyway, following are a few comments on issues unrelated to sound.

The Infinity Modulus L/R satellites could be more stable — in the course of my tests, I knocked one over twice. This shouldn't be a problem unless small children, or a cat, have the run of your home theater. Although I had my doubts about the optional TV-mounting bracket, it worked quite well, and when you use it, stand stability becomes moot. I also spent some time with the RABOS kit to tune the sub's equalizer. It took about an hour and was somewhat tricky, but the detailed instructions led me through it.

The Klipsch system is the most traditional of the three. Its front L/R speakers need some floor space, and because they sit relatively low, you have to make sure your ears aren't too far above the tweeters when you listen. In my case, the futon I listen on aligned me perfectly. Since the SF-2 cabinets are big, they'll be prominent in all but the largest listening rooms.

The Mission front L/R satellites work best as bookshelf speakers, but the almostflat surrounds beg to be plastered against a wall. The curvy center speaker melded beautifully with my TV, blending in much better than any boxed speaker (or "look-atme" design) I've tried. If you want speakers to be heard but not seen, the Missions are probably the best bet in this group.

Powered Up

To separate victors from vanquished in this speaker comparison, I selected two war epics for my listening material. I started

with the CD soundtrack of Enemy at the Gates (Sony), a recent WWII flick dealing with the siege of Stalingrad. James Horner's score is the real Hollywood deal, filled with orchestral pathos, and I listened to it several times, mainly in stereo (front L/R plus subwoofer), occasionally indulging in artificial ambience processing.

Several tracks have exposed violin parts, followed by massed strings. The Infinity L/R satellites provided a very open and transparent high end. This sweetness extended to the female vocals in the choral sections. The satellites didn't have as much punch or depth in the baritone and bass choruses as I'd have liked, but lower-midrange frequencies are notoriously tricky too low for many small satellite speakers to reproduce but too high for some subwoofers. The Infinity satellites played loud enough in my large room to shake my martini glass but never threatened to break it.

The Modulus subwoofer did an excellent job, pumping out clean, deep bass in the thickest orchestral passages. Whether it was the RABOS equalizer or good oldfashioned cone motion, the sub provided very musical bass sound. In my room, however, I wasn't able to eliminate a gap between its top range and the bottom of the satellites that robbed the system of some impact. Someone experimenting with sub placement in a different room might very well achieve a better blend.

The Mission m72 speakers had a refined "British sound" characterized by a soft high end and a warm low end. Violins never sounded harsh, lower strings were lush but never turgid, and the lower midrange had lots of oomph.

But I was surprised at the speakers' performance when I cranked them up. With most speakers the sound becomes more and more unnatural and unpleasant at louder volumes, but the m72s resisted that tendency. My only concern was a somewhat "blatty" brass sound at high volume. The

	m72 (front L/R)	m7c1 (center)	m7ds (surround)	700ASi (subwoofer)
TWEETER	1-inch dome	1-inch dome	two 1-inch domes	
MIDRANGE		two 41/4-inch cones	two 41/4-inch cones	
WOOFER	61/4-inch cone			10-inch cone
ENCLOSURE	vented	vented	vented	vented
POWER				150 watts
DIMENSIONS (WxHxD)	8 x 13½ x 12¼ inches	20 x 5½ x 5 inches	14½ x 9¼ x 4¼ inches	161/8 x 17 x 173/4 inches
WEIGHT	16 pounds	7 pounds	65/8 pounds	36 pounds
FINISH	black woodgrain vinyl	charcoal gray	black woodgrain vinyl	black ash woodgrain vinyl
PRICE Total: \$1,450	\$350 a pair	\$200	\$400 a pair	\$500

Rd., Pine Brook, NJ 07058; www.del.denon.com; 973-396-0810



700ASi subwoofer provided good, clean bass that matched the m72's refinement. Its output was not mighty by any means, but it was musical even during complex orchestral passages. Moreover, the blend between the sub and the satellites was quite good, with decent upper-bass punch.

The Klipsch SF-2 satellites have a size advantage over their counterparts in the other two systems. Not surprisingly, they generated a huge sound whose punchy, solid upper bass seamlessly merged with the subwoofer. The satellites' bass output went lower than that of the others, but it wasn't worlds more powerful. It clearly had more authority, probably because of the far greater volume of the Klipsch cabinets. But the horn-loaded tweeters had a very outspoken presence. Some folks will like this quality, but it was a bit too aggressive for my taste on strings, cymbals, and other percussion with extreme high-frequency content. The mighty impressive KSW-12 subwoofer displayed plenty of low-frequency guts. It anchored the Enemy at the Gates orchestral score with all the bass I cared to dial in.

Movin' to Movies

But you're probably considering one of these systems mainly to watch movies, not listen to music. And what better way to test a system's surround sound chops than with a big, rumbly submarine flick — like last vear's *U-571* (Universal) — with its depth charges, popping rivets, and other ambient sounds of the sailors' underwater environment. The Infinity system's center speaker had a more robust lower-midrange timbral quality than its L/R counterparts, but it lacked some warmth. Even so, dialogue sounded clean and crisp, whether female or male. Voices of the men on the conning tower during a raging storm were perfectly intelligible.

The surrounds, which are identical to the front L/R satellites, did a good job with ambience even if they weren't as immersive as some dipole surrounds I've heard. The Infinity subwoofer again impressed me with its big sound — someday all subs will come with an equalizer and do-ityourself tuning kit like the RABOS.

The Mission system provided accurate yet mellow movie sound. The m72s re-

tained all the warmth I'd admired in music playback. The m7c1 center speaker provided neutral sound with a warm high end. Dialogue was easily intelligible - even the faintest "Ahoy!" from across the water but the sound was somewhat pulled back, and I sometimes wished for a bit more upper-midrange presence.

The m7ds bipole surrounds were pretty good, creating an immersive sound field wherever I sat. When a machine-gun firefight erupted aboard the U-boat, I ducked for cover. Playing music, the surrounds' timbre was also good and similar to that of the other Mission satellites. However, they buzzed distressingly when I pushed them with loud surround effects. The 700ASi subwoofer was solid throughout, with bass that resounded with clarity and authority, and enough power to enliven the action

Not surprisingly, the Klipsch system provided theater-size movie playback. The Tractrix horn tweeters, which had been too zippy for me in music listening, worked quite well in a film context. The SC-1 center speaker gave tremendous presence to

IN THE LAB

	INFINITY	KLIPSCH	MISSION
	MODULUS	SYNERGY SF-2	M70 SERIES
FREQUENCY RESPONSE (at 2 meters) front left/right center surround subwoofer	100 Hz to 13.1 kHz ±3.8 dB	61 Hz to 17.2 kHz ±8.5 dB	77 Hz to 18.5 kHz ±4.0 dB
	110 Hz to 14.2 kHz ±2.5 dB	106 Hz to 19.5 kHz ±4.6 dB	95 Hz to 18.4 kHz ±3.9 dB
	100 Hz to 12.3 kHz ±3.8 dB	100 Hz to 10 kHz ±4.2 dB	95 Hz to 6.5 kHz ±3.6 dB
	31 to 131 Hz ±2.9 dB	34 to 108 Hz ±2.4 dB	36 to 105 Hz ±3.5 dB
SENSITIVITY (SPL at 1 meter with 2.8-volt pink-noise input) front left/right center surround	90 dB	93 dB	91 dB
	89 dB	94 dB	90 dB
	90 dB	88 dB	90 dB
IMPEDANCE (minimum/nominal) front left/right center surround	4.6/10 ohms	3.9/16 ohms	3.9/8 ohms
	5.8/10 ohms	3.8/16 ohms	6.8/8 ohms
	4.6/10 ohms	4.0/16 ohms	4.4/6 ohms
BASS LIMITS (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room) front left/right center surround subwoofer average SPL from 25 to 62 Hz maximum SPL	80 Hz at 74 dB	25 Hz at 71 dB	50 Hz at 82 dB
	80 Hz at 77 dB	80 Hz at 84 dB	80 Hz at 78 dB
	80 Hz at 74 dB	80 Hz at 79 dB	80 Hz at 66 dB
	20 Hz at 79 dB	20 Hz at 70 dB	20 Hz at 82 dB
	104 dB	100 dB	104 dB
	110 dB at 40 Hz	113 dB at 62 Hz	107 dB at 62 Hz

All of the curves in the frequency-response graphs are weighted to reflect how sound arrives at a listener's ears with normal speaker placement. Front left/right speakers are averaged over a ±30° window, with double weight given to the most typical listening angle, 30°. Center speakers are averaged over ±45°, with double weight directly on-axis, where the primary listener would sit. Because sound from surround speakers is

reflected from room surfaces, surround speaker response is averaged over a ±60° window, with double weight 60° off-axis.

Bass limits for each subwoofer were measured with it set to maximum bandwidth and placed in the optimal corner of a 7.500-cubic foot room. In a smaller room, you can expect 2 to 3 Hz deeper extension and up to 3 dB higher sound-pressure level (SPL) from any of these subwoofers.

The Infinity MS-1 left/right satellite had limited low-frequency capability directly on-axis, an elevated midrange, and a sharp peak at 7 kHz followed by a gently falling response at very high frequencies. When I measured it off-axis, the midrange and treble peaks, which tend to give a false sense of clarity, diminished. The radiation pattern was uniform out to ±60°, with falling response as the microphone moved farther out.

effects and dialogue, which was among the most intelligible I've heard. If you've ever watched a movie and missed a line of dialogue because it was swallowed up in the ambient sound, the Klipsch Synergy is your speaker system.

The SS-1 surrounds were equally zingy, and their angled tweeters provided a great sense of immersive ambience, with excellent highs no matter where I was sitting or how I placed the speakers. The mechanical thuds from all around the boat, the reverberation in back as rifles are locked and loaded, and the delayed echoes that recreate the claustrophobic feel of a submarine interior — all were expertly conveyed. Throughout, the KSW-12 subwoofer was excellent, cranking out plenty of rumble. When a torpedo hit a U-boat amidship, the implosion literally rocked my room.

Something for Everyone

Not surprisingly, since each of these three speaker systems approaches the playback problem from a very different standpoint, they have different strengths and weaknesses. That's a good thing, because not all

home theater shoppers have the same needs or preferences.

The Klipsch Synergy is an old-school big-speaker system designed to blow you away with brilliant highs and powerful lows. I certainly appreciated the latter, but the former were too aggressive for my musical taste. With music playback, I would have to throttle down my treble control. On the other hand, for movies, the forward high end seemed just about right, giving dialogue and film effects a realistic presence. In short, the system's overall sonic power was terrific for Hollywood soundtracks, which is why I'd choose it for movies.

The Mission system really caught my attention. I've always been partial to the warm, dark voicing of British speakers, and the m72s have that in spades. Although the 700ASi sub is hardly a powerhouse, its bass performance was certainly sufficient for my taste. Moreover, I like the styling of both the m7c1 center speaker, which seemed like a part of my video monitor, and the m7ds surround, which would look great mounted on the side walls of a home theater. Of course, I also appreciate their similarly

warm sound quality. I do wonder if this system has enough juice to give me the loud effects I sometimes want to hear from movies. If it was my own money, and I was listening mainly to music, I'd pick Mission's m70 series system.

The Infinity Modulus system's strong points are compact size, elegant styling, and room-tuning precision rather than sonic horsepower. Its tactile, soft-plastic enclosures with brushed-aluminum trim would look stunning in modern décor with glass and chrome highlights. While the size of the satellites does limit their lowerfrequency output and overall volume potential, this is a good system for smaller spaces. The sub is excellent, providing superb bass at reasonable levels, and its response can be optimized for your room.

Whether your priority is movies, music, or finding something that looks good in your room, you can pick a winner from this trio of systems. But if you're looking for top performance in all three respects, then you'll just have to learn that we don't always get everything we want. Sorry, but I don't make the rules.

The Klipsch SF-2 front L/R speaker suffered from the 300-Hz floor-bounce effect typical of tower speakers. The curve shows an octavewide peak centered at 700 Hz, which helps account for the speaker's aggressive sound. Our graph averaging tends to underplay the relatively large changes in response I observed with small changes in listening angle. The SF-2 had excellent low-frequency performance. Both the SF-2 and the SC-1 center speaker are unusually sensitive, so they can play loud with a relatively low input power level. On the other hand, impedance dipped to 4 ohms or less between 200 and 300 Hz for all channels, which could be problematic for some older receivers

The Mission m72 front L/R satellite had exceptionally smooth response, with a mild elevation around 100 Hz and a slight downward tilt at the high end. This characteristic is associated with warm, natural-sounding speakers. Its radiation pattern was very uniform over the ±30° window.

The Infinity MCC-1 center speaker's response curve has the basic shape as the MS-1's but with less pronounced anomalies. Response remained good to 15° off-axis, but a deep, wide notch centered at 2.5 kHz formed at radiating angles of 22° and greater. The Klipsch SC-1 center speaker's curve highlights the response peaks at 2.3 and 6 kHz and the 4-kHz dip between them. Directivity changed significantly with radiation angle, with flattest response at 15° off-axis and large, deep notches at 22° and any greater listening angle. The Mission m7c1 center speaker had excellent response to 22° off-axis. but a deep notch centered at 2 kHz formed at wider angles. Although directly on-axis the speaker's response was slightly elevated between 800 Hz and 4 kHz, the curve's overall shape has the same downward tilt as the m72's.

The Klipsch SS-1 surround speaker gave the flattest response at 45° off-axis, but there were fairly radical shifts in response pattern at every

listening angle, as there were for the bipolar Mission m7ds surround. Such results usually indicate that a surround speaker can provide a good sense of envelopment. The Mission surround shared the rolled-off top-end response of its brethren and had distinctly limited bass response

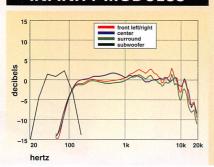
The Infinity MSW-1 subwoofer had remarkably good output. It's unusual to find subwoofers that attain their maximum sound-pressure level (SPL) below 50 Hz. The MSW-1 averaged 108 dB from 32 to 62 Hz. The fixed low-pass filter's -3-dB point was at 120 Hz, with a 24-dB per octave slope.

The Klipsch KSW-12 subwoofer had excellent bass extension, but most of its low-distortion output was concentrated at 40 Hz and above.

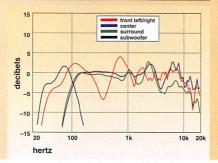
The Mission AS700i sub had excellent extension along with a smooth power response, averaging 106 dB between 32 and 62 Hz

- Tom Nousaine

INFINITY MODULUS



KLIPSCH SYNERGY



MISSION M70 SERIES



BATTLE OF THE BOUSSIELFS



ILLUSTRATIONS BY SAM SISCO

he Naked Truth — that's what you're going to get here. Since this is the first time **Sound & Vision** has done a direct-comparison listening test of small bookshelf speakers — models that are sized and styled for budget or secondary stereo and home theater systems — we decided to make it as rigorous as possible.

Why? Because in any comparative listening test there are going to be winners and losers. The trick is to make the test fair. Our comparison method sought both to eliminate the effects of listener preconceptions and bias *and* to help each speaker

sound as good as possible. To do this we took several steps:

- **Physical setup.** We arranged the speakers in each comparison group of three stereo pairs as close to each other as possible so the listener only had to turn his head slightly to bring the sonic image of each pair into focus. We equalized their heights by raising and lowering the stands so the height of the stereo image didn't change.
- Level steup. We matched the speakers' levels within better than half a decibel using a test signal, a sound-level meter, and the level-trim controls on our switch-
- ing panel. This step was extremely important because any larger deviation would have biased the comparisons in favor of the loudest speakers in each group. The master volume control was set at levels appropriate for each track we played.
- **Switching setup.** To make the differences in sound quality as vivid as possible, each listener was able to switch between speaker pairs instantaneously while music was playing. The ear quickly forgets tonal contrasts and adapts to new tonal colorations, so rapid switching is necessary for critical comparisons.
 - Listening setup. The two experi-



enced listeners — yours truly and my colleague Al Griffin, **S&V**'s senior reviews editor — were literally kept in the dark as to which speakers we were hearing at any time. All six speaker pairs were hidden from us behind an acoustically transparent curtain of black grille cloth stretched across the listening room, and the room was darkened so the speakers were invisible. (Just try to get away with this at your local audio dealer!)

Hiding the speakers eliminated any effect that knowledge of which model we were hearing might have had on our sonic judgment. It also removed aspects of appearance, such as enclosure size and styling, from consideration. This was strictly a listening test — and a double-blind one at that, since it was S&V executive editor Brian Fenton who hooked up the speakers to the switching panel. Neither Al nor I knew which trio was being compared in our two sets of initial trials (which we conducted separately from each other). After all six speakers had been compared, we each held a "bakeoff" between the winners in the three-way comparisons.

Throughout the comparisons, each model was referred to only by the color of the switcher button, and only Brian knew which button was connected to which pair of speakers. We even wrote up our results without knowing which was which, and the brands and models were inserted into this text at a later point — again, to avoid any brand-related bias.

Think we went too far? Were too scientific? Not warm and fuzzy enough? I'll let Al's comment on the procedure answer those reservations:

"At first, I didn't feel that such rigorous, double-blind testing conditions were necessary to evaluate speakers. But once the testing got underway, I found the lack of crutches — brand recognition, personal history and bias, visual preferences — liberating because it forced me to rely solely on my ears. Being able to switch instantaneously between speakers was also beneficial. Without rapid switching, flaws in the speaker tend to get smoothed out over time as your ears adjust. With rapid switching, sonic differences are much more easily grasped."

Why Small Bookshelfs?

We asked each company to send its best "bookshelf" speaker priced around \$300 a pair. We chose that target not only because it's a very popular price range, but also because it tends to be the lowest price at which speakers can supply reasonably full-range sound without a subwoofer. Not that a subwoofer wouldn't help: all six speakers in our comparison roll off steeply in the bottom octave (20 to 40 Hz), so none of them can reproduce the full, body-punching impact of an action-movie explosion or an orchestral bass drum. You shouldn't expect them to, either, though both Al and I tried them with this kind of material.

The speakers here are so similar in size, driver complement, and enclosure design (see "Fast Facts" below) because their makers are caught between the rock of the laws of physics and the hard place of manufacturing costs. Specify a price range for speakers, and you're likely to get very similar engineering solutions, especially at lower prices, where there's not much room for the designer to wiggle. It's the mostly subtle or invisible details — like the type

MANUFACTURER	MODEL	PRICE	DRIVERS	ENCLOSURE	DIMENSIONS (HxWxD)	WEIGHT (each)	FINISH
Acoustic Energy distributor: Audiophile Systems 8709 Castle Park Dr. Indianapolis, IN 46256 317-849-5880 www.aslgroup.com	Aegis One	\$300 a pair	51/4-inch metal-alloy cone woofer, 1-inch silk-dome tweeter	vented	141/4 x 71/2 x 91/4 inches	15½ pounds	black, beech, and cherry vinyl
Boston Acoustics 300 Jubilee Dr. Peabody, MA 01960 978-538-5000 www.bostonacoustics.com	CR75	\$300 a pair	6½-inch copolymer woofer, 1-inch Kortec dome tweeter	vented	12½ x 7½ x 9¾ inches	12 pounds	black ash or white vinyl
Jamo 1177 Corporate Grove Dr. Buffalo Grove, IL 60089 847-465-0005 www.jamospeakers.com	E 610	\$350 a pair	6½-inch cone woofer, 1-inch dome tweeter	vented	13¾ x 85% x 97/s inches	14½ pounds	cherry, beech, or black ash vinyl
KEF distributor: Adcom 10 Timber Lane Marlboro, NJ 07746 732-683-2356 www.kef.com	Cresta 2	\$299 a pair	51/4-inch coated- paper cone woofer, 1-inch silk-dome tweeter	vented	14½ x 8 x 9½ inches	13½ pounds	cherry or black vinyl
Monitor Audio 902 McKay Rd., #4 Pickering, Ontario L1W 3X8 905-428-2800 www.monitoraudio.com	Bronze 1	\$299 a pair	5½-inch metal- matrix polymer cone woofer, 1-inch gold-dome tweeter	vented	12½ x 6½ x 7 inches	11 pounds	black oak, cherry, or white vinyl
NHT 527 Stone Rd. Benicia, CA 94510 800-648-9993 www.nhthifi.com	SB1	\$299 a pair	51/4-inch polycone woofer, 1-inch aluminum-dome tweeter	sealed	10½ x 6½ x 6¾ inches	8 pounds	white or black piano- gloss

and quality of the drivers, the crossover design, the spacing of the drivers, and the size, shape, and location of ports — that make these similar-looking speakers sound so very different from each other.

Critical Listening

For each speaker, Al and I gave separate scores on a five-point scale for tonal balance, dynamics, bass, and imaging. (Al's scores are given in blue and mine in red.) These four parameters are often discussed as if they're independent of each other, but they're not. Even a small difference in bass output can have an enormous influence on the perceived tonal balance and dynamics. Imaging is likewise greatly influenced by the tonal balance above the bass range. These interactions help make all the scores go up and down together. A good speaker will tend to perform well in all respects.

Al and I wrote up our notes separately right after our independent listening comparisons, while the sounds were fresh in our minds and without discussing our results with each other. These uninhibited comments were based solely on what we heard and on our musical tastes and reviewing personalities - which, as you'll see, are quite different.

The first comparison pitted the Boston Acoustics CR75 (\$300), Jamo E 610 (\$350), and KEF Cresta 2 (\$299) against each other, while the second was between the Acoustic Energy Aegis One (\$300), Monitor Audio Bronze 1 (\$299), and NHT SB1 (\$300). Since we listened to only three speaker pairs at a time, the comments rarely refer to models not in that particular group of three. Remember that our notes originally referred only to the colors of the selector buttons (green or blue, say) and that the actual brand and model names were inserted later during editing.

Also keep in mind that the rankings pertain only to these six speakers judged against each other. If any of them had been grouped with five other speakers, its ranking may have turned out differently.

Acoustic Energy Aegis 1

	00	
Tonal balance	3	4
Dynamics	3	4
Bass	3	4
Imaging	4	3

Al Griffin: Though hardly shy on bass, the Acoustic Energy Aegis One delivered considerably "looser" low notes than the Monitor Audio Bronze 1. The electric bass guitar on the Charlie Hunter Trio's reading of "Come As You Are" (see "12 Discs to Judge Speakers By," page 97) sounded tubby and ill-defined, while the bowed strings of the acoustic bass had a downright mushy sound that was out of step with the rest of the speaker's tonal range. The speaker's fairly muted highs, which were evident on every track I listened to, created an overall dark presentation that robbed the cymbals in Charles Lloyd's "The Water is Wide" of their sizzle and the drums in Beth Orton's "She Cries Your Name" of their snap.

On the plus side, the Aegis One displayed good imaging. The huge soundstage in both the Charlie Hunter and Charles Lloyd cuts came across about as well as it did with any speaker in this

group, and the wide lateral spread of Massive Attack's "Angel" was also delivered intact.

Dynamics were just okay. The speaker held together well through the loud crescendos at the culmination of the Massive Attack cut, but it stumbled on the subtle peaks and valleys in Goldfrapp's "Paper Bag," which were somewhat murky and indistinct. The Aegis One probably wouldn't sound bad on its own, but in A/B comparison with the other speakers, its laid-back highs and loose bass were hard to overlook.

David Ranada: The slightly muffled quality in the strings I sensed near the beginning of Mozart's opera The Abduction from the Seraglio persisted through all the other orchestral selections I tried, as well as with the Bach organ music and some hardpsichord music. (See "12 Discs to Judge Speakers By" for details about the CDs I relied on most heavily.) This slight congestion hampered spatial reproduction and clarity in complex textures. Both male and female vocals came out very well,

however. Bass performance was excellent, especially when the speakers were being played loud.

Boston Acoustics CR75

Tonal balance	3	4
Dynamics	4	4
Bass	4	3
Imaging	3	4

AG: The CR75 immediately registered itself as a good rock speaker in my book, providing a decent wallop of bass, clear mid frequencies, and a slightly forwardsounding high end that helped to convey the snap of the drum kit and plucked acoustic-guitar strings on the Beth Orton track.





The vocals sounded slightly sibilant on both the Orton and the Goldfrapp, however. And when pushed to loud volumes, the sax on the Charlie Hunter became coarse. Also, compared with the Jamo, the Boston's lower midrange sounded sucked-out and anemic on this track — a quality that was most evident during the drum-kit buildup in the second half.

Imaging was good, although it lagged behind some of the other speakers here. There was a decent sense of width on the Massive Attack cut, but a somewhat shal-

> lower sense of depth. The dynamic performance was also good, conveying the crescendos in this song with only a minimum of audible effort. The speaker also did well with the Beth Orton track. All things considered, I'm sure that the Boston's clarity, combined with its better-than-average bass, will please a good number of listeners. In the end, however, I found its sonic signature lean and somewhat dry.

DR: The Boston Acoustics CR75's slight upper-midrange/





lower-treble boost, at least relative to the Jamo and the KEF, gave it a forwardness and clarity missing from the others, especially in loud and complex textures. The boost also contributed to an excellent sense of spatiality that benefited choral and orchestral music. At times, however, the Boston speaker's tonal balance gave a slight steeliness to the massed strings in the Copland and Stravinsky ballets, and the Mozart and Bizet operas, plus a twinge of sibilance to vocals. Played very loud, it could turn harsh in timbre, an impression abetted by its slightly less full upper-bass response compared with the Jamo and KEF. It overloaded, but not severely, on the bass drum in Stravinsky's Rite of Spring.

Jamo E 610

Tonal balance	4	4
Dynamics	4	4
Bass	4	4
Imaging	5	3

AG: The first two cuts I listened to on the Jamo E 610 were jazz selections. Right away, I knew that I'd found an appropriate



back high end took the edge off the aggressive sax solos on the Charlie Hunter Trio selection, while its punchy, very low-reaching bass helped to convey the drum kit's tremendous energy and drive. While I found this top-end reticence somewhat less engaging on pop songs like the Beth Orton track, the overall tonal balance struck me as very good, with excellent results on vocal recordings and midrange-focused instrumentals like the Charles Lloyd track.

The Jamo also excelled at imaging. The stereo spread cast by the speakers seemed boundless - the ambient scratches and clicks on the Massive Attack track seemed to come from hundreds of feet away. And when this same track erupted into all-out rock mode toward the end, the Jamo showed itself capable of wide dynamics, effortlessly conveying the slamming drum kit and roaring guitars. The Jamo proved to be a standout speaker in virtually every parameter. Though its slightly dark sound caused it to trail behind the Monitor Audio Bronze 1 in the bakeoff, I'd be happy to own a pair of Jamo E 610s.

DR: The Jamo's tonal balance produced a slightly recessed orchestral image, especially compared with the

Boston Acoustics. It was also slightly less clear than the Boston in the complex textures of The Rite of Spring as well as the Run Lola Run soundtrack. On my homemade recording of an a cappella doo-wop quintet, the Jamo's tonal balance was a tad less accurate than the Boston's. However, its superior bass performance — evident on the Stravinsky and the Bach organ music - helped its dynamics score. While I caught a hint of an undue resonance on

> one operatic vocal, in general vocals came out accurately. The E 610 came in a close second to the Boston in its three-way comparison, which was almost a tossup even though they sounded quite different.

KEF Cresta 2

Tonal balance	2	2
Dynamics	2	2
Bass	1	1
Imaging	3	3

AG: You can tell a lot about a speaker by focusing on how it handles cymbals. Unfortunately for the KEF Cresta 2, the prominent cymbal scrapes on the Charles Lloyd cut sounded thin and pretty much devoid of complex

overtones and air. Things might have balanced out a bit if the Cresta 2 had been capable of as much bass as the Boston Acoustics CR75. But its low end was fairly anemic, kicking in only enough to help muddy the midrange. As for tonal balance, the KEF was my least favorite speaker in its group of three.

While it didn't score badly on imaging, it was hardly a standout. The KEF managed to deliver the spaciousness of the Goldfrapp mix and ably handled the wide stereo spread in Massive Attack. But its overall presentation was flat, and its dynamics were often compressed. This was most obvious during the hard-driving conclusion to the Massive Attack cut. The mix



cendos, and the speaker's already thin bass became even more deficient.

DR: Whatever other merits this model may have, they were hard to hear through its decidedly muffled and colored sound. This was immediately evident on the very first track I played (the Mozart opera) and was impossible to ignore as I continued listening. The somewhat nasal coloration made it difficult to understand the lyrics and spoken dialogue in the operas and produced a somewhat congested sense of space. Playing the KEF loud further emphasized the tonal misbalance, and its woofer was the first of its group to overload on The Rite of Spring's bass-drum whacks. The background noise on several recordings, which was unduly emphasized by the KEF Cresta 2 when it was played loud, also sounded colored (this is a useful test, since the ear's sensitivity to tonal values changes with volume level).

Monitor Audio Bronze 1

Tonal balance	5	4
Dynamics	4	4
Bass	5	4
Imaging	5	4

AG: The Monitor Audio's most obvious qualities were its wide dynamics and earpleasing tonal balance. The sax solos on the Charlie Hunter track sounded effortless, and there was a tremendous sense of ener-



gy and momentum when the drums build up in intensity toward the end. The Bronze 1 had the second-deepest bass of all six speakers, transmitting full, tight, and welldefined lows. The bowed bass strings on the Beth Orton track came across as clean and powerful. The highs on this cut were nicely detailed, with the high-hat cymbals and snare drum sounding crisp but not at all fatiguing.

The midrange performance was magical. The Monitor Audio sounded best on the Goldfrapp cut's breathy, close-miked female vocals and the piano solo on the Charles Lloyd, both of which were appealingly smooth and liquid. Imaging was also good, with the panorama of the Massive Attack mix coming across with impressive width and depth.

DR: Aside from having, by a slight mar-

gin, the best bass performance of the six speakers, the Bronze 1 did a better job than the Acoustic Energy and NHT of clearly reproducing complex orchestral textures. It also gave an excellent sense of space in cathedral choir music (Descants from Trinity, Conifer). While the string sound could be a touch harsh and steely if played very loud, vocals on cuts like my homemade recording of a doo-wop quintet came out

12 DISCS TO JUDGE SPEAKERS BY

Al Griffin and I took different approaches to selecting and using recorded music to evaluate the six speakers in this comparison. Al confined most of his listening to five well-chosen CD tracks, which are listed below. I, too, subjected every speaker to a core selection of discs, also listed below. My tracks were perhaps less cannily chosen, being mostly from recordings I've liked on higher-end speakers. But unlike Al, I selected several tracks from each recording and varied them at will, depending on what I was hearing from each speaker, since the various tracks from a disc might contain very different kinds of musical sounds. I also felt free to dip into the rest of my CD collection. In all, I used tracks from around 25 discs, including some CD-Rs of homemade — D.R. recordings.

Al's List

- Goldfrapp, Felt Mountain (Mute),
- "Paper Bag." This track's breathy, closemiked female vocals are an acid test for a speaker's midrange clarity. The strings at the end are useful for determining the amount of top-end "air" and the overall level of detail.
- Charlie Hunter Trio, Bing, Bing, Bing! (Blue Note), "Come as You Are." This hard-driving jazz interpretation of Nirvana's rock classic is great for evaluating a speaker's dynamic capabilities and midbass performance. The huge soundstage is also very good for checking imaging.
- Charles Lloyd, Water Is Wide (ECM), "The Water Is Wide." A pure recording of mostly acoustic instruments, this track is excellent for evaluating tonal balance, midrange clarity, and imaging.
- Massive Attack, Mezzanine (EMD/ Virgin), "Angel." The extremely lowbass synth notes that open this song are great for checking bass extension. The all-out sonic assault at the end is

also good for evaluating dynamics.

• Beth Orton, Trailer Park (BMG/Dedicated), "She Cries Your Name." Orton's clear alto vocals are very good for testing midrange clarity. The drum kit and bassguitar attack give an excellent account of overall dynamic range, and the strings at the beginning are a good test of a speaker's overall tonal balance.

David's List

- Bach, Organ Works, Vol. 1 (Teldec); Ton Koopman. You can't beat a wellrecorded pipe organ for supplying firm, extremely deep bass notes in a large, natural acoustic space.
- Bizet, Carmen (Valois); Orchestre National Bordeaux-Aquitaine, Alain Lombard cond. A fifth-row-center perspective with very wide dynamic range, outstanding orchestral clarity, and vocalists that actually seem slightly more distant than the orchestra, as they are in an opera house.
- Copland, Billy the Kid / Rodeo / Appalachian Spring (BMG Classics); San Francisco Symphony, Michael Tilson Thomas cond. Large orchestra

but generally simple textures and an enormous dynamic range, with a bass drum in Billy the Kid that delivers an impressive impact. Excellent for lateral imaging, too.

- Mozart, The Abduction from the Seraglio (Telarc): Scottish Chamber Orchestra, Charles Mackerras cond. Another opera recording with extremely well-recorded voices. The tonal qualities of the percussion against the strings in the overture are particularly revealing.
- Run Lola Run (TVT). The complex techno textures of this movie soundtrack are difficult to deliver without harshness when played loud, especially the vocals.
- Stravinsky, The Rite of Spring | Firebird Suite (Delos); Oregon Symphony, James de Preist cond. I use Tracks 6, 14, and 18 for their large orchestra, very wide dynamic range, and, at times, extremely complex textures overlaid with a pounding bass drum. This disc is also good for evaluating image depth.
- Surround Spectacular (Delos). Some of the stereo test tones are suitable for speaker evaluation, including the pink noise we use for speaker balancing and tones for judging bass extension and







sounding very natural. The Monitor Audio produced the best sound of its comparison trio playing both loud techno music (Run Lola Run) and even disco (the soundtrack from Saturday Night Fever).

NHT SB1

Tonal balance	2	2
Dynamics	2	2
Bass	1	2
Imaging	2	2

AG: My first impression of the NHT was of anemic bass and in-your-face highs. That was also my last impression. On virtually everything I listened to - particularly the bass-rich Massive Attack, Beth Orton, and Charlie Hunter tracks - its top-loaded tonal balance gave me cause to complain. The speaker's overly crispy high end did add definition to the dense and somewhat formless mix of Goldfrapp's "Paper Bag." But the constant snare-drum rolls that propel this song sounded paperthin, and the massed strings that come in toward the end sounded unpleasantly edgy.

On top of having poor tonal balance, the NHT also came up short in dynamics. The normally snappy drum kit on the Beth Orton track sounded flaccid. And when things should have been rocking out at the end of the Massive Attack cut, the sound was constrained and somewhat compressed, with poor distinction between the elements in the mix. As for imaging, the tall, deep, and very wide soundstage of the Charlie Hunter track came across as flat, with little breathing room between the instruments.

DR: My first impression was that this was by far the most forward-sounding of the six speakers, but it soon became evident that its highs were not properly balanced by its lows. The NHT had a "boom-tizz" quality that made many pop recordings sound effective even though I was getting mostly upper bass and mid-to-upper treble, with not much going on in between. The voices in the opera recordings took on an unpleasant and definitely unnatural coloration. Because orchestral music was reproduced much too far forward, the speaker's ability to reproduce stage depth was diminished. Strings often sounded steely. The NHT's frequency response also unduly emphasized a recording's background noise, which reduced a dynamics score that had already been marked down for overloading on the bass drum in The Rite of Spring.

The Bakeoffs

Our dual three-way comparisons each produced a semifinalist. Al selected the Monitor Audio Bronze 1 and the Jamo E 610. while I selected the Boston Acoustics CR75 and the Monitor Audio.

AG: Both of the speakers in my bakeoff had excellent imaging and dynamics, good bass, a clear and coherent midrange, and a pleasing tonal balance. Given their affordable prices, both are true finds. Over time, however, I'd probably prefer the Monitor Audio because of its slightly better detail and dynamics, and its tight, punchy bass.

DR: Despite the pleasantly forward sound of the Boston Acoustics — which also produced nice spaciousness in cathedral choir music and slightly better bass on recordings like the Bach organ music - I ultimately preferred the Monitor Audio because it produced the most livable tonal balance with many kinds of music and at different volume levels. In particular, it sounded less harsh when played loud than the Boston Acoustics. The clincher was Track 3 of Run Lola Run, which sounded good through both speakers until the heavily processed and equalized voice came in. Played loud, as this kind of music should be, it practically tore my ears off with the Boston Acoustics yet simply sounded heavily processed and equalized through the Monitor Audio.

So even though we got there by traveling very different paths, Al and I independently converged on the Monitor Audio Bronze 1 as the best-sounding speaker of the six we compared.

Upon Further Review

Ideally, the best speakers — the Boston Acoustics, Jamo, and Monitor Audio, plus the Acoustic Energy Aegis One - would have been compared directly with each other in a final bakeoff. But the size of our listening room doesn't permit a fair fourway comparison in stereo, even with these small speakers, because the speakers' different distances from the walls would become the dominant factor (something to keep in mind with any showroom demonstration). But after some speaker repositioning by Brian Fenton, I was able to perform a solo four-way bakeoff in mono, still

without knowing which models I was listening to and with the switcher-button assignments rescrambled.

While mono playback meant I couldn't judge stereo imaging, it did allow me to do a direct comparison of the top models under even better positioning conditions than in the stereo test. The result: in a dead heat, the Monitor Audio Bronze 1 and Acoustic Energy Aegis One beat out the still slightly edgy Boston Acoustics CR75, with the Jamo E 610 coming in third.

With many musical selections I was unable to discern a difference when switching directly between the Monitor Audio and the Acoustic Energy - a very unusual result. At other times I could hear a difference, but neither sounded "better" than the other. And when one test track led me to believe I was ready to declare a winner, the next track often sounded slightly better on the other speaker!

After sampling a couple dozen more CDs trying to make a definitive judgment, I declared a tie. While the Monitor Audio and Acoustic Energy sounded quite similar, they were equally good overall and definitely better than the other four models — with the sole proviso that the Monitor Audio was slightly better at handling very loud deep bass.

Listening for Yourself

So there you have it. The winner, fair and square, is the Monitor Audio Bronze 1. Al would encourage you to give the Jamo E 610 a listen, too, as I would for both the Acoustic Energy Aegis One and Boston Acoustics CR75. All four models deserve serious attention. But there are several lessons to be learned beyond these results:

• Lesson #1. Experienced and critical listeners using wildly different program material can come to very similar or even identical conclusions about the sonic quality of a speaker, given a sufficient variety of music and a listening-test environment where fair and free comparisons can take place.

If you're lucky enough to find a cooperative dealer, try to incorporate some of our fairness safeguards into your own comparative auditions. While most dealers will be unwilling to install a curtain in front of the speakers - and, after all, unlike in our test, a speaker's appearance is relevant to your choice — at least try to have the speakers positioned so the tweeters are at approximately the same height relative to your ears as they will be when you are seated in your listening room (we had all the tweeters about 1 meter off the floor). A good dealer will also let you place the speakers you're comparing right next to each other so that the stereo soundstage shifts very little from left to right when you switch between them.

Try to match the speaker levels closely - with a sound meter and a test tone if possible, but at the very least using a bandlimited test tone (such as those on the Delos Surround Spectacular CD or Ovation Software's Avia test DVD). A dealer can throw the results of any speaker comparison to his more profitable model by making it as little as 1 dB louder, especially if the speakers sound similar to begin with.

• Lesson #2. Take along a variety of your own discs to the audition. Dealer-selected demo music can bias a listening test. Use the store's discs only if you already know them very well.

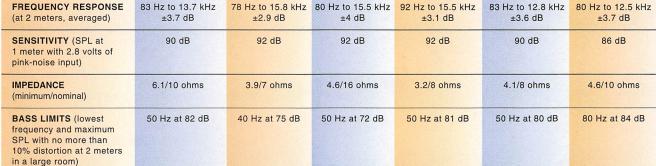
Using a number of familiar tracks that exhibit at least five different musical textures (slow, fast, simple, complex, acoustic, electronic, very soft, and very loud), as Al and I did, will decrease the influence of any one disc's sonic peculiarities on your choice. You don't want to end up with a speaker that sounds good only on one track of one disc.

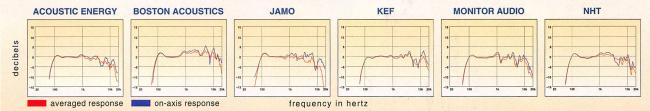
• Lesson #3. You can use our test, and especially our blind comments on each speaker's sound, to teach yourself how to be a critical listener. Take along our comments to any speaker audition, even for speakers in a higher, or lower, price range, and listen to one of the models we auditioned, regardless of its final standing. Using either your own musical selections or the same ones we used, try to hear what Al and I heard and described. Even our comments on the speakers that fared less well

may be useful, as they point to aspects of speaker sound that cause trouble in any price range.

If you try to listen fairly, ignoring the manufacturer's reputation and the various blandishments offered by, at this point, an undoubtedly irritated salesman, be prepared for some surprises. We were surprised at some of our results, with some of the better known brands stumbling in comparison with models from smaller or lesser known companies. (The NHT's substantially smaller size and audibly limited bass abilities suggests that it might do much better as a satellite paired with a subwoofer.) We're fascinated enough by these results to already be contemplating which brands and models to request for our next speaker comparison. Don't worry — while we'll be going for the naked truth again, both Al and I will remain fully clothed.

THE **Acoustic Energy Boston Acoustic** Jamo KEF **Monitor Audio** NHT **Aegis One** CR75 E 610 SB1 Cresta 2 **Bronze 1** FREQUENCY RESPONSE 83 Hz to 13.7 kHz 78 Hz to 15.8 kHz 80 Hz to 15.5 kHz 92 Hz to 15.5 kHz 83 Hz to 12.8 kHz (at 2 meters, averaged) ±3.7 dB ±2.9 dB +4 dB ±3.1 dB ±3.6 dB **SENSITIVITY** (SPL at 90 dB 92 dB 92 dB 92 dB 90 dB 1 meter with 2.8 volts of pink-noise input)





As usual with our frequency-response graphs for stereo speakers, the red curves are an average of several measurements taken over a ±30° "window," with double weight given to the 30° listening angle. While many people arrange their speakers so that they're listening from off-axis in this way, that's not how Al and I listened to them. We aimed them directly toward the listening position, so their on-axis responses (the blue curves) dominated our listening impressions. The general shapes of the respective on-axis curves, as well as some of their fine-scale detail, are reflected in our listening comments in various interesting ways (note that the measurements were done after we wrote up our remarks). In a later article, we'll delve deeper into the important subject of relating speaker response curves to perceived sound quality

For now, Tom Nousaine, who performs our speaker measurements, pointed out a few notable characteristics of the speakers' performance that may help put the data in perspective. For example, he mentions the "roughness" above 3 kHz in the curves for the Boston Acoustics, KEF, and NHT speakers. The averaged response of the Jamo led him to conclude that it "may sound better when it's angled into the listening area," which is

how the speakers were set up for our listening sessions. And the "downward" tilt of the Acoustic Energy and Monitor Audio curves stood out for him, with the former having a more uniform response at all listening angles. Note also that these two speakers are the only two with no significant peaks in their response curves above 1 kHz. A narrow peak is usually more objectionable than an equivalent dip.

Tom's tests for bass limits (which are much more demanding than almost all music) show that the Acoustic Energy, Boston Acoustics, and Monitor Audio models performed better than average for bookshelf speakers. On the basis of the numerical data, I'd add the KEF to that list, too. The high bass-limit frequency of the NHT indicates that it really needs to be used with a subwoofer.

The low minimum impedance of the KEF indicates that it should be used with a receiver or amplifier that can comfortably handle 4-ohm loads (look for one whose 4-ohm stereo-output wattage is approximately double its 8-ohm wattage). In contrast, the Jamo's high sensitivity and moderate impedance make it, in Tom's words, "a happy load for most - D.R electronics.'



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How to read our lab tests for speakers by Tom Nousaine

istening is the key to evaluating any speaker — which is why **Sound & Vision** makes the reviewer's subjective appraisal, based on extended listening, the key component of any test report. But quantitative information derived from measurements can also be useful in evaluating a speaker, or in comparing it with other speakers — which is why an "in the lab" box accompanies each test report.

It's easy to assess the measured performance of most audio equipment. The frequency response of a good amplifier, for example, is "flat" to within a few tenths of a decibel (dB) over the audible range at all power levels within its capacity (meaning that its response *curve* approaches being a straight line). But the response of even the best speakers *isn't* flat over the entire audible range,

and few even have a response that varies from "flatness" by no more than 3 dB up or down.

And, while electronic components like amplifiers and receivers operate in a completely electrical environment, speakers have to transform electrical energy into acoustical energy — in other words, they have to take an electrical audio signal and change it into motion that creates sound. To do that, they combine a diaphragm with a voice coil or another moving element that can be "driven" by changes in the audio signal. Because of their partly mechanical nature, speaker drivers are much less precise in their operation than an electronic component. That's why measurements of speaker performance require substantial skill and experience to interpret. While our data don't cover every possible aspect of performance, they *can* suggest

a speaker's potential and provide clues to how well it will fit in with the rest of your system and with your room.

Frequency Response

Because of reflections from the walls, ceiling, and floor, a room's acoustics can have a big impact on how a speaker sounds. But rooms often differ a great deal, so it's hard to accurately measure a speaker's *own* performance in any space where the acoustics come into play. That's why speakers are often measured in an anechoic chamber — an acoustically dead space that lets you measure just the speaker's *direct* output.

Occasionally I'll measure a speaker's frequency response outdoors — "God's own anechoic chamber," as editor at large Julian Hirsch calls it — but that's not always practical. I can simulate anechoic conditions for a subwoofer indoors by using a near-field tech-

nique, placing the microphone within half an inch of the driver. But I can't use that technique for speakers with two or more drivers since it doesn't allow for a proper blend of their output. So here's what I do instead:

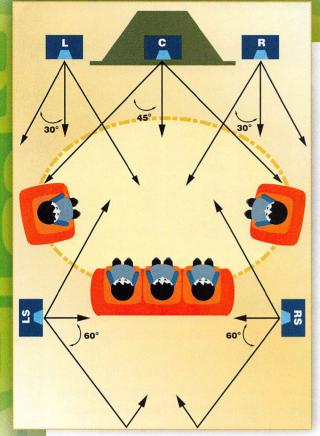
For any speaker except floor-standing and in-wall models, or a subwoofer, I measure frequency response (and sensitivity) by placing it on an adjustable $3\frac{1}{2}$ - to 8-foot tall stand in the center of my very large (7,500-cubic-foot) room. Naturally, I measure floor-standing speakers with them placed on the floor and in-wall speakers actually mounted in a wall. In each case (except for subwoofers, which are measured near-field), I place the microphone 2 meters (about $6\frac{1}{2}$ feet) from the speaker, which allows the output of the various drivers to combine properly.

To drive each speaker under test, I use a maximum-length sequence (MLS) signal — essentially pseudorandom noise — generated by a DRA Labs maximum-length sequence

system analyzer, or MLSSA (pronounced "Melissa"), connected to my PC. Thanks to MLSSA, room-acoustic effects above roughly 200 Hz are removed from my room measurements — that's why the results are called quasi-anechoic. It does this by analyzing the sounds that reach the microphone and separating the direct sounds from the reflections, which arrive later. (I also use MLSSA to analyze the near-field subwoofer readings.)

To generate the raw data, I take readings directly on each speaker's primary axis and at various angles (for left/right pairs, I generally measure only one speaker in the pair). The angles — my measurement "windows" — depend on how the speaker is likely to be used in a typical home theater or stereo system, based on a survey of 250 listening rooms.

Showing separate response graphs for several listening angles would likely be more confusing than useful and take up far too much space, which is why we average the re-



Five main-channel speakers are shown properly placed in a home theater of average dimensions, 15 x 20 feet with an 8-foot ceiling. (Total area is 300 square feet.) The arrows suggest how sound typically reaches listeners from the various speakers. The angle indications are the "windows" we use for frequency-response measurements.

sults and show only a single curve for each model or type of speaker in a system.

The averaging is weighted to reflect how the speaker's sound arrives at the ears of a listener seated in the center position on the couch (see diagram above). Double weight is given to the most common angle of incidence: 30° for stereo or front left and right speakers (assuming they're facing straight out and not toed in toward the center), 0° (on-axis) for a center speaker, and 60° for left/right surround speakers.

The curves are averaged over ½12-octave intervals, which smooths out the transitions for easy analysis while keeping them detailed enough to reveal response irregularities (peaks and dips) whose effects are likely to be audible.

To derive the main-channel graph curves and some of the data in the sample lab box on the facing page, I used the front L/R speaker, a two-way bookshelf model, from my reference home theater system. When this speaker is used for all five main channels, as in this example, the differences in the curves and frequency-response figures reflect only the different weightings and measurement angles.

In the front L/R positions, the speaker has a very flat response curve, with little deviation above and below the average output over its useful operating range and an even bass-to-treble balance that gives it a smooth, uncolored sound. You can see some bumpiness between 1 kHz and about 6 kHz, which may in part be caused by the crossover between the woofer and tweeter at 2 kHz. Such irregularities in the crossover region are common, and this speaker actually shows far fewer of them than most.

Above 6 kHz, the curve's slight downward tilt and the absence of large peaks or dips correlate with an airy, open high end. While not perfect, this speaker's measured performance is about as good as it gets above 100 Hz at normal listening levels. The curves for the center and surround channels have the same smooth shape not surprising since it was the same speaker. But even when a system's center and surround speakers are different from the front left/right speakers, their response curves should have a similar shape, since that means they have a similar tonal balance and

can create a smoothly blended sound field.

Common speaker problems that show up in response graph curves include: a bass-to-treble tilt or imbalance indicated by a substantial shift in average level from low end to high end; a rough-sounding midrange indicated by relatively large peaks and dips, often related to the typical crossover region from 2 to 4 kHz; degraded sound for off-center listeners, indicated by increasing irregularities in the off-axis response curves. Averaging tends to smooth out these deviations, and that's why we weight our curves for the most important listening angles.

Horizontally arrayed center speakers in particular — with a tweeter between two woofers or midrange drivers — typically display deep notches in their response curves, usually beginning around 15° offaxis between 1 and 4 kHz. The notches may widen, deepen, and sometimes shift in frequency as the microphone is moved further off-axis. This effect can make the center speaker sound colored, indistinct, or harsh for listeners seated off to one side, which is especially bad for home theater, because the center channel carries movie dialogue. Since our averaging tends to

downplay this effect, whenever it's unusually severe, I comment on it in the notes accompanying the graph.

Most floor-standing speakers show a response notch between 150 and 300 Hz, called "floor bounce," because slightly delayed sound reflected from the floor in front of the speaker mixes with the direct sound to the listener. This usually isn't a serious problem, but again, I'll add a comment if it's warranted.

Surround speakers often have limited treble and bass performance, which isn't a problem with most program sources. But some of the new DVD-Audio and Super Audio CD recordings make good use of full-range surround channels, and as multichannel audio becomes more sophisticated, it will be more important for a speaker system to have that capability. Meanwhile, off-axis smoothness is more important, because much of the surround-channel sound that reaches your ears will have been reflected from room surfaces at least once. Bipole and dipole surround speakers are designed to radiate sound toward the front and back of the room - instead of toward the listening position, as in the above diagram (which shows direct-radiating speakers) - so they may sound good despite having fairly rough-looking response curves.

The subwoofer curve in the sample graph (not from my reference sub, just a good, representative model) may look more like a child's drawing of a mountain than a straight line, but by speaker standards it's pretty "flat"! The curve is smooth, and within the sub's normal operating range of 25 to 100 Hz, it varies less than ±3 dB. The overlap here with the main-channel speakers is almost ideal, but if you have small satellite speakers that roll off well above 100 Hz, you'll want a sub that has better response up into the midrange to avoid an upper-bass/lower-midrange "hole."

My lab notes usually include comments about the operating characteristics of sub-woofer controls, especially whether there's any interaction between the level and cross-over settings. Most controls vary somewhat from their nominal (marked) settings, but if they're too far off, it can be hard to adjust the sub's response for the best fit with satellite speakers in your room.

Sensitivity

Sensitivity has nothing to do with sound *quality* but concerns how *much* sound a speaker can produce when it's driven by a standard-level input signal, which suggests how powerful an amplifier you'll need to

play it at the volume levels you want. The sensitivity measurement tells you the sound-pressure level (SPL), in decibels, the speaker will produce at 1 meter (a little over a yard) given a 2.83-volt (1-watt) pink-noise input. I actually measure sensitivity, like bass limits (see below), for all speakers at 2 meters, deriving a figure for 1 meter by adding 6 dB (because SPL falls off by 6 dB as you double the distance).

The sensitivity figures in the lab box — which are representative, *not* measurements of my reference speakers — show that the front L/R speaker is 3 dB more sensitive than the other speakers. Therefore, it'll require less amplifier power to reach an equivalent SPL, or volume level. But most speakers today are relatively sensitive, and watts are cheap, so all else being equal, any sensitivity measurement above 85 dB is fine. A sensitivity reading above 90 dB is exceptional. Since powered speakers, including nearly all subwoofers, have their own amplifiers, sensitivity for them is irrelevant.

Impedance

Impedance describes the typical "load" a speaker presents to the amplifier or receiver driving it. While this can be helpful in matching up the components of a system, it also has nothing to do with sound quality. Since most modern speakers are "easy" loads, and most amplifiers today are stable even into low, or "tough," impedances (4 ohms or less), this is rarely an issue. Impedance is irrelevant for powered speakers that contain their own amplifiers.

Minimum impedance is the lowest impedance a speaker falls to throughout its operating range. Nominal impedance, a kind of average, is the speaker's typical impedance at most frequencies most of the time — home audio speakers are usually rated at 8 ohms nominal impedance. In the sample lab box, the minimum impedance is rather low for two of the speakers (again, these are not actual measurements of my reference system). This could be a problem if you try to drive them with an older or low-power amplifier or receiver. Low sensitivity and low impedance often run hand in hand.

Bass Limits

Bass limits tell you how low in frequency a speaker can play, and how loud, without objectionable distortion. Using special tone bursts that ascend in frequency by onethird-octave steps, and with the microphone at the optimal listening position, I increase the drive level until the the speaker's output distortion reaches 10% or its distress is clearly audible. (Distortion is audible with pure test tones at much lower levels, but music and sound effects tend to mask it. Above 10%, distortion increases exponentially and sounds really nasty!)

For main-channel speakers, I note the lowest frequency and the highest SPL obtained with acceptable distortion. My reference L/R speaker, which I measured for the main channels in this example, has significant output down to 40 Hz, which means that it produces respectable bass and could be used as a full-range speaker. But since it can't achieve more than 80 dB SPL at 40 Hz with low distortion, it needs the support of a subwoofer if I want the full impact of movie soundtracks and music with deep-bass content.

I measure subwoofers through their entire operating range, noting every one-third-octave frequency and SPL that reaches the 10% distortion limit. Then I average the recorded SPLs over the 25- to 62-Hz range (the heart of the bass spectrum) as well as noting the maximum SPL achieved regardless of frequency. It's important to know how a sub performs in the 25- to 62-Hz range because music and soundtracks with strong bass tend to have a lot of content there. But some material has significant content even below 25 Hz, so it's also helpful to know just how low a subwoofer can go.

To measure bass limits, I place subwoofers in the optimal corner of my room, which I determined by measuring the performance at many different locations. In

my room, the optimal listening position happens to be 2 meters from the optimal corner.

Placing every sub in the same corner and measuring it from the same listening position produces bass-limits measurements that are easily compared from one model to another. Because my room is unusually large, my measurements understate the output a sub could deliver in a typical room by 2 to 3 dB, but the *relative* results should hold true in any room.

The sample sub's bass limits in the lab box show excellent extension — it can play deeper (20 Hz) than its quasi-anechoic frequency response, which rolls off well above 20 Hz, would lead you to believe. (Sometimes room acoustics can enhance sound quality, not just degrade it!) The sub also has excellent "power response," indicated by the closeness of its 108-dB average SPL to its 109.6-dB maximum SPL. More than a 5-dB difference in these figures means that the subwoofer has significantly more oomph in one part of its range than in the other — usually the upper part. The difference of less than 2 dB in this case suggests that the sub can reproduce sounds across the bass range with equal enthusiasm.

ou should now feel more confident about using the "in the lab" boxes in our speaker test reports to help select models to audition. Just remember that measurements are only a starting point. They're no substitute for an experienced reviewer's subjective comments — or for listening to speakers on your own.

in the lab

FREQUENCY RESPONSE (at 2 meters) front left/right
SENSITIVITY (SPL at 1 meter with 2.8 volts of pink-noise input)
front left/right .90 dB center .87 dB surround .87 dB
IMPEDANCE (minimum/nominal) front left/right 5.6/10 ohms center 3.4/8 ohms surround 3.6/8 ohms
BASS LIMITS (lowest frequency and maximum SPL with limit of 10% distortion at 2 meters in a large room) front left/right

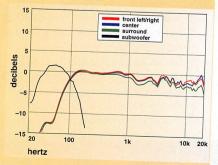
center......40 Hz at 80 dB SPL

surround......40 Hz at 80 dB SPL

subwoofer20 Hz at 84 dB SPL 108 dB average SPL from 25 to 62 Hz 109.6 dB maximum SPL at 62 Hz

This is where I describe the measurement conditions and comment on any results that are unusual or that don't fit into the four categories above.

— T.N.



VIDEOALL

e've landed men on the moon, created computers that can perform billions of calculations per second, and seen the birth of a wristwatch that plays MP3 files and takes digital pictures. So why, with all of this technology at your disposal, are you still enjoying your audio/video system in just one room? Having a professional install a system that can send sounds and images to all parts of your house is fairly painless — and it might not cost as much as you think.

In "Sound All Around" (July/August), I discussed how you could use a combination of amplification, speakers, and control devices to listen to your favorite CDs, radio stations, or other audio sources in any room. Now I'll tell you what's involved in routing video throughout your home.

Because installing multiroom audio and video is a lot more involved than setting up a typical home theater system, all but the most basic tasks are well beyond the abilities of the average DIYer. If you're planning to do much more than run a second set of speakers from your receiver, leave the job to a professional installer.

And if you think your current home the-

ater system has a lot of wiring, wait until you run cables to three, six, or more additional rooms. The installers for the company I work for have pulled over a mile of cabling in some homes! And it pays to plan ahead. Installing a multiroom system during new construction will save you quite a bit of money on the labor bill over having one retrofitted into an existing house.

More Ways to Display

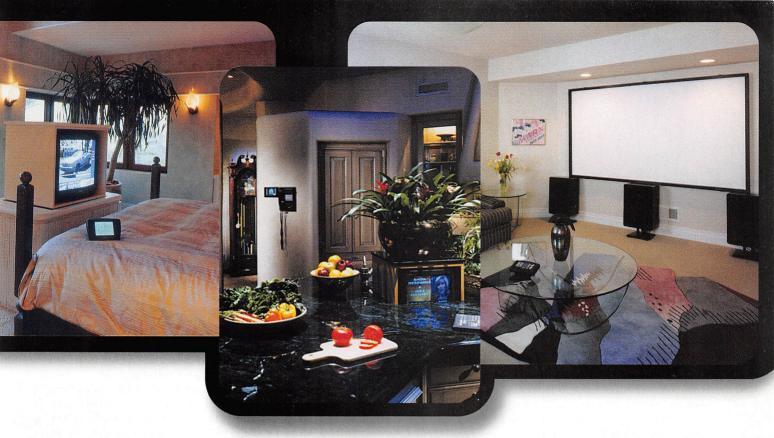
Of course, to watch TV or a DVD anywhere you want, you'll need some kind of video display. And since there's an unprecedented range of options available today, we'll take a quick tour of them before moving on to the nuts and bolts of sending a video signal throughout your home.

Essentially, there are five display types:

• Direct-view. Using a single large cathode-ray tube (CRT) to present the image, this is the kind of TV we're all most familiar with. Direct-view sets can provide terrific contrast and deep, dark blacks while still being bright enough to work in nearly any environment. Their biggest advantage, aside from familiarity, is price. You can buy a standard 19-inch set for a couple hundred bucks, while a top-of-the-line 36-inch HDTV monitor will cost you around \$3,000. Direct-view TVs have only two major drawbacks. First, they're limited in size. The largest one currently available with a squarish 4:3 aspect ratio screen is 36 inches (measured diagonally), although a 40-incher is on the way from Sony. The largest widescreen 16:9 direct-view set has a 38-inch screen. And these large glass screens make them extremely susceptible to glare. Reflected images don't just magically disappear when you turn on the TV, and they can lead to eye fatigue during long viewing sessions.

• Rear-projection. Most rear-projection TVs (RPTVs) use a set of 7-inch red, green, and blue CRTs to project the image onto a mirror, which then reflects it onto the back of the screen. Alternative rear-projection technologies like liquid-crystal display (LCD), digital light processing (DLP), and direct-drive image light amplifier (D-ILA) are becoming more common, but the sets are much more expensive than CRT models. RPTVs with 40- to 73-inch standard and wide screens are available from nearly every TV manufacturer at prices

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How to plan a system that can send TV and movies to any room

ranging from \$1,500 to more than \$10,000. While the current sets are much better than the RPTVs of yesteryear, their pictures still tend to be brightest when you stand right in front of them and fade out to some degree as you move off to either side. But if you need a screen larger than a direct-view TV can provide and don't have the big bucks for a front projector, a rear-projection set is the way to go.

• Front-projection. These babies are the Ferraris of the home theater world. A properly calibrated front-projection system can put up an image that will rival your local movie theater. For years, the best front projectors were CRT based, but both DLP and LCD technologies have recently begun to challenge CRT's dominance. Front projection's biggest advantage is size. You can create an image up to true movie-screen proportions, though sizes between 100 and 120 inches are the most popular. Also, unlike rear-projection or big direct-view TVs, which tend to be the focal point of whatever room they're in even when they're not turned on, front-projection systems can be designed so that both the projector and screen literally disappear when not in use.

There are some disadvantages, though. Having lights on when you're watching a movie will wash out the image onscreen. And your blacks will be only as black as your room. Finally, they aren't cheap. Prices range from \$3,500 to over \$100,000.

• Plasma. The electronics industry has been promising for years to come out with a TV that you can hang on the wall like a picture. Well, that promise has finally been fulfilled. Using a combination of xenon and neon gases, these sets create dazzling images while requiring only about 3 to 4 inches of depth. Most have 42-inch (diagonal) 16:9 screens, but some 50-inch models are available, and 60-inch models have been announced. Plasma displays have incredibly wide viewing angles with no offaxis brightness problems and deliver good contrast even when there's a lot of ambient light in the room.

The big drawback is cost. While prices keep coming down, you can expect to pay \$7,000 to \$10,000 for a 42-inch model and \$15,000 to \$25,000 for a 50-inch screen. Plasma displays also have trouble producing true black, but this has improved with each generation of sets.

• LCD screens. Chances are you've already experienced LCD technology on a watch, a calculator, a palm device, or a laptop computer. While current technology limits direct-view LCD screens to 10 to 28 inches, they can create a remarkably bright and vivid video image. Brightness tends to fall off rapidly if you view from an angle, however. Prices range from reasonable to astronomical. While you can get a 10-inch model for under \$1,000, a 28-inch LCD will set you back about \$17,000.

What Goes Where?

Low prices and a wide range of sizes make direct-view sets great for guest and kids' rooms. A 32- to 36-inch model will work well in a primary home theater in an average-size room or in a secondary home theater in a master bedroom or game room. Big rear-projection sets are terrific for setups in larger rooms where lighting or budget constraints don't allow a front-projection system. Companies like Toshiba, Panasonic, and Samsung offer 40-inch and larger models that are less than 18 inches deep - perfect for rooms that couldn't otherwise accommodate an RPTV.



Matrix video switchers, like AutoPatch's Epica-128, are customizable to allow for the unique input and output demands of each multiroom video system.

Plasma or LCD is the way to go when space is really at a premium, as in a home office, bedroom, or kitchen. And if having a fireplace centered on the main wall of your room has forced you to move your direct-view or rear-projection TV into a corner, thus compromising your surround sound setup, you could try hanging a plasma display over the mantle instead — assuming, of course, your budget permits it.

I Need My Space!

You no longer have to try to conceal your TV in an entertainment center that dominates a whole wall of your room. Companies like Chief, Peerless, Premier, and Vantage Point have developed innovative mounts that allow you to place a directive set on the ceiling or wall — a great alternative for places like a bedroom where you just don't have the spare floor space.

With plasma and LCD screens, the mounting options can be even cooler. Some mounts pull away from the wall and swivel for different viewing positions. One popular option for LCD sets slides out from under a kitchen counter and virtually disappears when the screen is not in use.

Companies like Auton and Lift-Tech make units that conceal the TV in a furniture-grade cabinet. A motorized lift raises the set to just the right height and can even swivel it, via remote control, to give you the best view from any location. And if you have absolutely no floor space to spare, these companies make lifts that allow you to conceal your TV in the ceiling.

Feed Me

Now that you've decided what displays to place around your house, you need to feed them with some kind of signal. There are several ways to get video from one room to another, and not all of them require you to have cabling already in place. But as with audio distribution, the simplest options usually offer the least flexibility.

Wireless is one way to go. Products like RF-Link's Wavecom or Terk's Wave Master beam A/V signals from one location to another using 2.4-GHz radio signals. Simply connect the outputs from the source component to the sender (transmitter), and connect the matching cables on the remote receiver to the inputs on a TV set or monitor, and you're ready to go. The senders and receivers are each about the size of a paperback book, with directional antennas on top so you can fine-tune the reception. While these devices can transmit through walls, it's best to try to maintain a clear line of sight between them. Keep that in mind when positioning them between your electronics and the remote TV.

More receivers can be added to display the same program on more than one TV, and the system can support up to four different frequencies for simultaneous broadcasting of multiple signals. These systems can also transmit infrared remote-control commands along with the A/V signal. As with any wireless device, the main drawback is reliability. These systems perform flawlessly in some homes and poorly in others. Check the store's return policy before making the \$140 to \$190 investment.

Terk's Leapfrog home network system uses a different approach to send video around your house without additional cabling. The hookup is similar to the Wavecom or Wave Master except that the

Leapfrog transmits the A/V signal via your existing telephone wiring without conflicting with any voice or data signal. It actually supports video quality better than VHS and standard cable TV. The main drawback is that you need to have telephone jacks near both the sending and receiving devices. As with the Wavecom or Wave Master, you can add receivers to the \$180 Leapfrog system to accommodate multiple TVs and you can transmit remotecontrol commands along with the A/V programs. All of these are "set up and forget" systems - once it's been installed, you don't have to make any further adjustments.

Some rear-projection TVs, like Toshiba's 43HX71, have narrow profiles so they can fit more easily into smaller spaces like bedrooms and family rooms.

Be Your Own Ted Turner

Channel modulators offer a more advanced way to send video all around your house. These devices take the A/V signal from your source (a DVD player, digital satellite receiver, or whatever) and turn it into a TV channel - similar to the way your VCR allows you to watch movies on Channel 3 or 4 of your TV. Imagine creating a DVD or VCR channel that can be viewed on any TV in the house with video quality nearly equal to the original. All it requires is an additional run of RG6 coaxial cable (recommended for transmitting cable-TV and digital satellite signals) from the modulator to your existing cable-TV wiring. The modulator is a small box with a set of A/V inputs and an output for coaxial cable. After selecting the number for the channel you want to create, the box can be hidden away behind your other gear.

You can use modulators to add a practically unlimited number of channels. They range in price from \$100 to nearly \$1,000, depending on the number of channels the device can create and whether they offer mono or stereo output. Channel Plus and Channel Vision offer the largest selections.

Get into the Matrix

For the ultimate in flexibility, you'll want a matrix video switcher whose multiple inputs and outputs allow you to route any source to any display at any time. You can even send one signal to all of the outputs simultaneously. And these devices are customizable to fit your specific needs, wheth-







Lift-Tech's Model LT-100 motorized lift allows you to conceal a TV in a furniture-grade cabinet so it can be raised into view when needed.

er that's 4 inputs and 8 outputs, or 12 inputs and 6 outputs.

Depending on their configuration, the back panel of a matrix switcher can look like an A/V receiver on steroids. Extron and AutoPatch offer a variety of switchers that can be controlled by any device capable of RS-232 communication. Elan has an 8x8 switcher that can be controlled either via RS-232 or infrared, making it a little friendlier. Using this kind of technology requires extensive design and wiring, however, so leave the job to a pro. Also, because every display will be given a separate video feed from the switcher, there's usually too much wiring for retrofitting to be an option. Depending on configuration, you can expect to spend between \$800 and \$3,000 for this level of switching flexibility.

Smile, You're on **Candid Camera!**

Video distribution isn't just about movies. Security and monitoring via video cameras are other common applications. Modern microchip technology has improved the picture quality of these cameras while reducing their size and price to the point where they're now ripe for the consumer market. Mounting options are nearly unlimited. For covert ops, you can conceal the camera inside in-wall speakers, smoke detectors, motion detectors, the front doorbell, or even pieces of art. You can also mount it on the wall or ceiling.

It can be useful to have cameras posted at your front and back doors, in the nursery, and by the swimming pool. You can even use black-and-white cameras with infrared illumination (similar to the military's night-vision gear) to monitor unlit areas at night. You can use these cameras in combination with a channel modulator and a TV that offers picture-in-picture (PIP) to keep an eye on the sleeping baby or the kids in the pool while watching your favorite TV show. Cameras are available from many companies, including CSI-Speco, Channel Vision, and Channel Plus.

Cameras range widely in price, from about \$100 to well over \$1,000, depending on quality and on options like lenses, color, and remote controllable tilt-and-pan adjustments. Infrared illuminators, available from CSI-Speco and Rainbow CCTV among others, are \$200 and up.

The Circle Is Complete

After reading this article and last issue's "Sound All Around," you should have a good understanding of multiroom audio/ video distribution. Now we get to the fun part — tying all these ideas together to create a customized system that addresses your family's needs. A properly installed and integrated home-entertainment system allows all members of the household to enjoy whatever they want, wherever they want.

In the kitchen, Mom hits Satellite on her wall-mounted keypad control and watches House & Garden TV on her 12-inch underthe-counter LCD screen with the audio piped in through ceiling speakers. Dad, in his study, uses his desk-mounted touchscreen to bring up CNN on the plasma TV while checking out the stock prices on the touchscreen. He then uses it to select his favorite CD, which plays over a pair of bookshelf speakers. In the home theater, Junior has some friends over to watch a DVD on the front-projection screen and THX-certified surround sound system. Grandma, up in the guest bedroom, decides that she wants to watch the movie, too. She calls up the DVD on her 27-inch tabletop TV and then points her remote at the infrared target on her wall-mounted

keypad to lower the volume coming from her in-wall speakers. And all without missing a beat!

But you should always consult with a professional installer when contemplating such a system. Any money you might save by doing it yourself will probably be offset by whatever mistakes you make along the way. And many systems require custom programming for the hardware that's available only to authorized dealers. A future article will explore choosing an installer, but in the meantime, visit www.cedia.org to find the nearest member of the Custom Electronic Design and Installation Association. It's his job to create a system that meets your budget and needs.

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MANUFACTURERS

How to reach companies mentioned in this article

www.auton.com

AutoPatch

www.autopatch.com

Channel Plus

www.channelplus.com

Channel Vision

www.channelvision.com

Chief

www.chiefmfg.com

CSI-Speco

www.csi-speco.com

www.elanhomesystems.com

Extron

www.extron.com

Lift-Tech

www.televisionlifts.com

Panasonic

www.panasonic.com

Peerless

www.peerlessindustries.com

Premier

www.premiermounts.com

Rainbow CCTV

www.isorainbow.com

RF-Link

www.rflinktech.com

Samsung

www.samsung.com

Sony

www.sel.sony.com

Terk

www.terk.com

Toshiba

www.toshiba.com

Vantage Point

www.vantagepointcorp.com

How to get the most out of your satellite-TV system

ing the switch from cable to satellite TV, and why not? A satellite system can deliver hundreds of TV and music channels digitally with amazingly clear picture and sound quality. And depending on your system and programming package, you can get Dolby Digital surround sound, HDTV movies, blazingly fast Internet access, and more.

ore and more

people are mak-

True, you can get many of the same things from digital cable, but that's only popped up in some parts of the country so far, while you can check out satellite TV just about anywhere.

The small-dish satellite systems for receiving programming from DirecTV and EchoStar's Dish Network are usually professionally installed, often as part of a package that includes the receiver, a dish antenna, and a programming subscription. And that's the way it should be, because installing a satellite dish requires both patience and skill. (Installation of the much larger and more complex C-band satellite antennas is beyond the scope of this article.)

Nevertheless, if you've completed a homeimprovement project such as installing a ceiling fan or garage-door opener and aren't afraid to climb a ladder, you should be able to install your own system. Doing so will save you some money (although the satellite services often offer free installation with the purchase of a program subscription) and give

you that warm and fuzzy feeling that always comes with a job well done.

Because of the potential danger involved, though, I have to issue this important warning before going any further: Use extreme caution. Avoid power lines touching one could cause severe shock or even electrocution! Also, installing a satellite dish might mean going out on your roof. If you have any doubts about any aspect of the installation, do not proceed.

This article can still be useful even if you decide not to do it yourself. I'll tell you how to determine if the location of your house even allows for satellite reception and give you an idea of what to expect from an installation, what questions to ask the installer, and what each piece in your satellite system does. I won't go into every installation and connection option, however, since these can vary widely.

Where to Put It

Before even thinking about buying a satellite-TV system, you need to determine if you have a suitable location for installing

the dish, which serves as the antenna that picks up the satellite signal. There must be a clear line of sight from the dish to the satellite, with nothing blocking the path that includes trees, mountains, and buildings. And you can't put the dish indoors behind a window since the satellite signal won't go through glass.

All of the satellites used for today's small-dish TV systems are located above the equator in a geostationary orbit which means they orbit at the same speed as the Earth's rotation and thus remain



Before you buy a system, make sure you have a clear line of sight to the satellite from where you'll mount the antenna dish.

fixed at the same position in the sky. This enables a dish to be permanently pointed at the satellite. The primary satellites for both Dish Network and DirecTV are located south of the middle of the country, so you'll need to aim your dish southwest if you live on the East Coast, southeast on the West Coast, and due south in the Midwest.

Allow about 20° to 60° of leeway for pointing the dish up and down. Since the satellites are located over the equator, you'll be using a shallow angle (about 30° above the horizon) if you live in the north and a steeper angle the farther south you go. If you've examined the possible locations and still aren't sure you have a suitable spot, consult a professional installer or dealer.

Get Coordinated

Once you've purchased a system, you'll need to access the satellite receiver's onscreen menus to get the coordinates for aiming the dish. Connect the receiver properly known as an integrated receiver/ decoder, or IRD - to your TV using standard A/V cables or by running an RF coaxial cable from the receiver's "out to TV" jack to the TV's "antenna in" jack. The receiver's menu will ask for your Zip code or other information to determine your location and give coordinates, in degrees, for:

- elevation the up/down angle at which the dish is pointed to the sky;
- azimuth the side-to-side angle of the the dish relative to due north ("0" on a compass);

• tilt — the angle at which the dish is skewed from its upright position along its vertical axis (necessary when it needs to be aimed at more than one satellite).

Now go outside to the mounting location and move a compass around until its pointer is due north. Then locate the tick mark on the compass that corresponds to your azimuth coordinate. That's where you'll need to point the dish. (If your compass lacks degree indications you'll have to estimate. Remember that due east is 90°,

due south is 180°, and due west is 270°.) Double-check to make sure you have a clear line of sight. You can use a protractor to establish the angle of elevation, though holding your arm out halfway between straight in front of you and straight over your head will tell you approximately where 45° is. You can then estimate the correct angle.

Assembly Period

Assemble the antenna before you take it to wherever you're going to mount it. This is ac-

Connect the receiver to the TV so you can see the antenna coordinates on the onscreen menu.

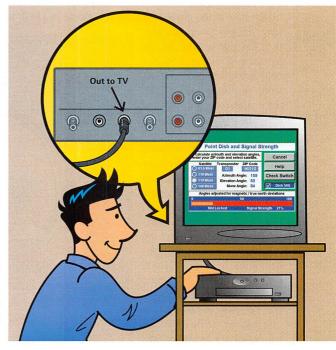
tually pretty easy (a lot easier than, say, putting together the bike you bought for your kid). All small-dish satellite-TV systems are similar and consist of the same basic parts:

- a reflector dish to collect the signals broadcast from the satellite — typically about 18 to 22 inches wide and more or less elliptical depending on which service you're using and what kind of programming you want to receive;
- a low-noise block downconverter, or LNB for short — a small module that fits onto the end of the dish's support arm, picks up the signals reflected off the dish, converts them to lower frequencies suitable for transmission through coaxial cable, and sends them to the receiver:
- a mast and mounting foot; and
- a support arm that attaches to the dish, holds the LNB, and fits on top of the mast.

First, attach the support arm to the reflector dish using the appropriate nuts and bolts (they should be supplied). Then set the elevation of the dish using the calibrated elevation indicator and scale on the side of the support arm. Loosen the nuts near the elevation indicator, move the dish so the indicator lines up with the number that corresponds to the elevation setting you got earlier from the onscreen menu, and tighten the nuts.

Mast Production

Once you've settled on a dish location, you'll need to secure the mast. It's best to bolt the mast's mounting foot to brick, concrete, wood-lap siding (but not vinyl or





Left, mount the antenna mast on wood siding, brick, or concrete. A roof can be unstable, and drilling the holes can cause leaking or other damage. Right, use a plumb line or a bubble level to make sure the mast is vertical.



aluminum siding), or a solid-wood wall stud. (It doesn't matter whether you place the dish high or low, in the front or back of the house, as long as you have a clear line of sight to the satellite.) If you secure the mounting foot to a stud, make sure it's in the middle of the stud, not at the edge. You can put the dish on your roof, but that might not be as stable as a wall mount, and you might damage the roof or even cause leaks when you drill the mounting holes. Be careful not to mount the dish under eaves, an awning, or any other structural feature that could block the signal.

Another option is to mount the dish on a free-standing pole made of galvanized 1½-inch round Schedule 40 steel pipe. Just remember that getting the cable into the house will mean digging a trench if the pole is located any distance away. (If you don't use direct-burial cable, you'll have to lay conduit as well.) Make sure that you drive the pipe in at least 3 feet while keeping it perpendicular to the ground, and then fill the hole in the ground with concrete to

keep the pipe in place. (Either cut the bottom of the pipe at a 45° angle or stick a bolt through it to prevent it from turning.) Follow the recommendations in the system installation manual to the letter.

Installation varies based on the type of fasteners used to hold the mast's mounting foot to the surface. For wood, use lag screws and washers. For brick or concrete, use expansion anchors, machine screws, and washers. For cinder block or hollow walls, use hollow-wall toggle bolts, machine screws, and washers. For pole mounting, use nuts and bolts. Be sure that any mounting hardware you

use beyond what's included in the installation kit is rated to hold the specified weight!

Place the mounting foot, mark where the holes will go, remove the foot, and drill. Then secure the foot with the fasteners. On an irregular surface like siding, use wood or plastic spacers under the foot to keep it plumb. Once you've made sure the foot is *precisely* level and vertical, tighten the fasteners and then insert the mast.

Get the Connection

Next, estimate the amount of cable you'll need to run from the dish to the grounding block and from there to the satellite receiver. Add a few extra feet to allow for the unforeseen. If your run is more than 110 feet, you'll need to add a line amplifier (available at RadioShack) to boost the signal at the receiver end. Use type RG-6 coaxial cable or the more expensive RG-11 cable. Do *not* use other cable types, such as RG-59U. They cannot adequately pass along the high frequencies output by the LNB.

You will have either a *single-* or *dual*-LNB system. A single-LNB system can feed one receiver, allowing you to watch a single channel, while a dual-LNB system can feed two receivers so your family can watch different channels independently in separate rooms. (You'll need twice as much cable for a dual-LNB system.) Consider running an extra length of cable when installing a single-LNB dish so you'll be ready if you decide later to upgrade to a dual-LNB system or add another dish, perhaps for a satellite Internet connection.

You can now finish assembling the dish by threading the coaxial cable through the mast and arm and connecting it to the LNB, which you can then secure to the arm. Run the coaxial cable from the antenna to a grounding block (which you can pick up at a RadioShack or your local hardware store) and then from the block into your house. Then run a ground wire from the block to a proper grounding location, such as a cold-water pipe. Your system *must* be grounded in accordance with





Left, attach the support arm to the dish and install the LNB. Right, run a cable from the dish to the grounding block and then through the house wall to the receiver. Be sure to run a wire from the block to a proper ground.

local codes, the National Electrical Code, and the manufacturer's requirements.

Before affixing the coaxial and grounding cables, make a "drip loop" by bending the cables in a 3- to 5-inch loop or "U" below the grounding block. This will prevent moisture from running directly from the cables into the house — it'll drip off the bend instead. Use silicone sealant to seal all outside connections (some antennas come with rubber weatherproof connector sleeves) as well as the hole you'll need to drill for the cables to enter your house.

Depending on your house's layout and construction, and how far the dish is from the receiver, running the cable could be the toughest part of the installation. Make sure you'll be able to snake the wire through the hole in the side of the house and through the intervening wall or walls to the re-

Helpful Hint

You can paint your dish to match your house. Just don't use lead-based or glossy paint, which will interfere with performance.

ceiver. Try to locate the dish near the room where you'll have the TV so there's only one wall to run the wire through.

My Aim Is True

Whew! Now it's time to aim the dish for maximum signal strength. Since you'll need to hear the beeping tones that indicate you've locked in a signal, position your TV so you can hear it from wherever you're installing the dish — even if that means hooking up a portable TV — or enlist the aid of a friend. (The signal strength will also be indicated on the screen, but you probably won't be in a position to see this.)

Bring up the onscreen dish-pointing menu. At first, the signal-strength meter probably won't be indicating that you're getting a signal even if you've aimed the dish in the right general direction. Adjust the dish's azimuth and elevation settings in small increments (the calibration markings on the dish assembly will help with this) until you get a signal, and then continue until you have the maximum signal strength. Since the beep will become higher or more rapid as you close in on the optimal position, you'll be able to keep your eye on what you're doing instead of the TV screen.

Next, run a cord from a nearby telephone jack to your receiver's phone connection so your satellite program provider can contact the special-access "smart" card in the receiver, activate access to pay-perview events, and perform other functions. If you don't have a phone jack nearby, get a long phone cord and plug it into any available jack for now. But plan to install one nearby or use a wireless phone jack instead. Now you're all set to call your satellite program provider to tell 'em you're online, and order those hundreds of channels you've been lusting for.

Hook Me Up!

If you're one of those people who want satellite TV not just for the vastly expand-

ed programming but also for the improved picture and

sound quality, hook up
the satellite receiver to
your TV or home theater receiver using the
best possible video and
audio connections. Using the A/V outputs
on the satellite receiver
will give you stereo audio and also give you
better video than the "out

to TV" RF coaxial output. Using the S-video output will give you better

video still (assuming your TV has an S-video input, as most newer models do).

Most satellite receivers have multiple

Most satellite receivers have multiple sets of A/V outputs, making it easy to connect them to both a TV and a VCR or to run the signal to more than one TV. You can also feed the signal to more TVs by splitting the receiver's coaxial RF output (as is commonly done with cable-TV signals). Since you're getting the signal from a single receiver, though, you'll see the



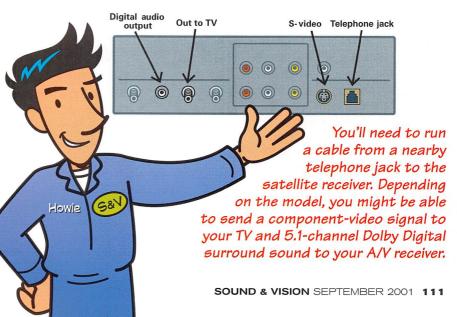
Place the dish assembly on the mast and position it for maximum signal strength.

same program on all the TVs. But you can use an RF remote-control/repeater unit to change channels from a remote location.

Most satellite receivers also let you switch between satellite broadcasts and terrestrial broadcasts via a regular antenna, for seamless transitions between channels regardless of the signal source. Some newer receivers even have an HDTV tuner, wideband component-video or VGA jacks, and digital audio outputs so you can enjoy HDTV broadcasts from both EchoStar and DirecTV with the highest-quality picture and 5.1-channel surround sound.

It's impossible to list all the connection possibilities, but most receiver manuals spell all the options out in detail. Ambitious DIYers can go hog-wild patching satellite TV into a multiroom or whole-house distribution system — but that's a topic for another article.

That's all for now, folks. The sky is calling! The sky is calling!



Multimedia Maven

The newest equipment, software, and Web sites

EDITED BY MICHAEL ANTONOFF

half a gig to go

There was plenty of hoopla over DataPlay's Saltine-size discs at the Consumer Electronics Show back in January, but since then the company has been keeping a decidedly low profile. In early summer, however, it told us that the first DataPlay-enabled products, slated to arrive later this year, will be music players, such as the Toshiba prototype shown here, and cameras (Toshiba will have one of those, too). Some 40 manufacturers in all have expressed interest in making DataPlay products, including Samsung, SonicBlue, Creative Labs, Imation, and Olympus.

Universal, BMG, and EMI say they will offer prerecorded music on DataPlay discs

when the hardware is available. A 500-megabyte (MB) blank disc is projected to sell for about \$10 — a tiny fraction of the cost of flash memory though several times as much as a blank CD-R. And given that manufacturers are already waging battles over a multitude of storage formats (disc- and flash-based), we wonder if DataPlay will manage to stake a toehold. **DataPlay** 720-562-2000, www.dataplay.com



tivo-like pc?

rying to broaden the appeal of a desktop computer previously sold mainly for video editing, Sony has bundled in a TV tuner card and slapped on a "With Personal Video Recorder" label. The Vaio Digital Studio PCV-RX490TV (\$2,600) strives to be as convenient as a set-top hard-disk recorder like TiVo or ReplayTV, but it comes up a little short. A free tenday electronic program guide is available while you're connected to the Internet, but the system is guideless offline and lacks QuickSkip and slowmotion functions. The Pentium 4, 1.7-gigahertz, Windows ME-based system allocates 68 gigabytes (GB) of its 80-GB hard drive for video, and if you don't want to watch on a computer monitor (not included), you can tether it to a TV set via an S-video output. It has a DVD-RW drive, so you can archive programs, but a blank disc costs about five times more than a tape. Ethernet, i.Link (FireWire), and USB ports, a modem, and external stereo speakers are included. Sony 800-476-6972, www.sony.com/vaio

all in one web radio

Considering that several Internet radio appliances, including the much-hyped Kerbango, were tuned out by Wall Street's tech wreck before they even went live, Philips has to be admired for forging ahead with its FW-i1000 Internet audio minisystem. Besides a dual-well cassette deck, a three-CD changer, and speakers, it makes it easy to tune in to world radio on the Web. There's an Ethernet jack for your broadband connection (required) to the iM Tuning Service, which lets you sort Web stations by genre, region, or language. Philips expected the \$499 system to be in stores in August.

Philips 800-531-0039, www.philips.com



webtoon to mtv

While some thought entertainment produced for the Internet would steal viewers away from TV, Web producers are now taking shows created with Macromedia Flash animation tools over to television. Slated to appear on MTV this fall is a



series adaptation of the two-year-old rap cartoon, *Miss Muffy and the Muff Mob.* Produced by Bullseye Art, the show has a *South Park* sensibility, though here it's a gang of muffin-making moppets.

fall déjà-vu

very September I buy the annual Fall Preview issue of TV Guide. It's a habit hard to break, but that could change now that the networks are offering show de-



scriptions, program schedules, cast photos, and video clips on their Web sites. Of course, you won't find a negative word anywhere, and every premiere is touted to be a breakout hit. Still, you can get a sense of what to expect (more of the same) and what to avoid (98% of what's on) — before turning on your TV. www.abc.com, www.cbs.com, www.fox.com, www.nbc.com,

www.upn.com, www.thewb.com

speed burner

🔁 laiming the industry record for ripping music — we mean. Uextracting data — Yamaha has launched the Light-Speed2 CRW2200 series of internal and external CD recorders. Besides being capable of recording to a CD-R at a blinding 20x speed and rewriting a CD-RW at 10x, they can rip music from an audio CD at a cool

40x — "allowing digital audio extraction of a 74-minute audio disc in less than three minutes." Whatever will we do with the other 71 minutes? The series includes the CRW2200ez (shown, \$250), an internal

IDE drive for PCs, and the external CRW2200fxz FireWire drive for Macs (\$379). Yamaha 888-926-2426, www.yamaha.com



adonna wannabes now can practice their singing skills by logging onto Karaoke Jukebox, a Web site that lets you stream synthesized music with highlighted lyrics from among more than 1,200 pop songs.



There's no limit to how many you can select, but don't plan on staying just a little bit longer your arias will be clipped the moment your pay period is up. Rates

WYAMAHA

are \$7.95 for 4 hours or \$14.95 for one day. Karaoke Jukebox, 613-721-1107, www.eatsleepmusic.com



gaming in high-def ttendees at this year's Electronic Entertainment Expo (E3) were surprised to see Ninten-

do displaying the games for its new GameCube console on Panasonic

high-definition television (HDTV) sets.

While Nintendo says the GameCube can output true high-def. 1080i-format signals if a game supports it, all of the games at E3 were running in the "enhanced-definition" 480p mode.

"The GameCube system has a progressive-scan mode," explains Brett Tosti, producer of the LucasArts Star Wars game Roque

Leader: Rogue Squadron II (below). "All of the scan lines can be fed to a set as a component-video signal." Even in 480p, when you fly through the famous trench in Roque Squadron II's Death Star battle, the enemy ships, laser blasts, and Death Star walls have a crisp look that hasn't been seen in previous games. Both the GameCube (\$199) and Rogue

Squadron II (\$50) are slated to go on sale November 5, Xbox, Microsoft's game machine — targeted for a November 8 launch at \$299 — is also capable of outputting a 1080i HDTV image, though no titles have been announced. You'll need a special A/V pack (price not set) that will include Svideo and digital audio outputs.

The new generation of game consoles also ups the ante on audio. Soft-

ware developers can take advantage of Dolby Digital sound on GameCube, Xbox, or PlayStation 2 games, and the game consoles can spit out either Dolby Digital audio or analog Dolby Surround-encoded stereo for decoding by an A/V receiver. At E3, Dolby Labs previewed games featuring



Dolby Digital 5.1 sound, including The Bouncer and Tony Hawk's Pro Skater 3 for PlayStation 2 and Unreal Tournament for PCs. Make no mistake: good sound has at least as much impact on the gaming experience as high-resolution graphics. Besides becoming more immersive, games like Unreal Tournament become far more eerie as you add realistic surround sound cues.

Dolby Labs 415-558-0200, www.dolby.com; LucasArts 415-472-3400, www.lucasarts.com; Microsoft www.xbox.com; Nintendo 800-255-3700, www.nintendo.com; Sony www.playstation2.com



Off-Road Gear

ho said mobile entertainment had to be restricted to audio/video playback in cars, trucks, and SUVs? Certainly not me. I've come across some fine systems in other vehicles recently — like a boat, a jet plane, and, yes, even the golf cart pictured below.

Right about now you're probably thinking, "Is he kidding? How good can these systems possibly be? Wouldn't ambient noise, weather, and other factors create a harsh environment for listening to music or watching movies?"

Well, of course they would — but that's where savvy installers and manufacturers step up to the plate and show what they're

You don't have to the open air, sea air, ments. As a result, you or even 30,000 feet



made of. Companies such as Clarion, Jenlower your A/V sen, Kenwood, MB Quart, Rosen, and a standards just host of others design because you're in gear specifically for these types of environdon't have to lower the standard of quality you up in the air. demand of your home and car A/V systems just because you're in the open air, sea air, or even 30,000 feet up in the air.

> One man who knows how to deal with off-

the-road environments is David "Fishman" Rivera, owner of Fishman Audio in Miramar, Florida. A creative installer who became famous (or infamous) for incorporating working fish tanks in mobile A/V systems, Rivera, 34, also built a reputation for thinking outside of the box (or car, as it were). After completing work on a string of high-profile manufacturer demo vehicles last year, Rivera was looking for a new challenge when he hit upon the idea of doing an install in a golf cart.

He teamed with MA Audio of Rancho Dominguez, California, and designed a surround sound system that features a Panasonic DVD-Audio/Video tuner, a pair of MA Audio video monitors — a 63/4-incher in the dash and a motorized 15-incher that rises dramatically out of the hood - two MA Audio amplifiers, and six MA Audio speakers (two subwoofers and two pairs of coaxial woofer/tweeter combos). There's lots of juice onboard to run it all, of course — six stock batteries power the cart while two Optima batteries run the A/V system.

"With this system, I wanted to show people how creative an installation can be," Rivera says. "I mean, who ever thought of putting a system in a golf cart, a jet ski, or even a wheelchair?" (all of which Rivera's done). "If you're a music and movie lover, my job is to show that you can take them wherever you want to go and enjoy them in an environment that's appealing to the eyes as well as the ears."

I spent a few good hours auditioning the golf-cart system with DVDs like The Matrix, the Eagles' Hell Freezes Over, and the Beastie Boys' Video Anthology, and I came away suitably impressed. Truthfully, I was not expecting this system to sound or look as good as it did. When I cued up the helicopter-truck battle in Chapter 64 of the "special-edition" expanded director's cut of Terminator 2: Judgment Day, the bullets Sarah Connor (Linda Hamilton) sprayed from her machine gun splayed across the golf cart's dash in wide (and

The accompanying militant drum track was rightly relegated to a secondary role and didn't overwhelm the main action.

Later, I walked behind the cart during miscellaneous carnage in The Matrix to check the open-air effect, and it was like approaching the doors of a movie theater after the film has started: the sound of shattering glass and low-end explosions made me want to get back in the driver's seat to see (and hear) what I was missing.

And to those of you who scoff at the notion of a rip-roaring golf-cart system because it's bound to be unwelcome in an environment where you're supposed to be quiet — "Just imagine pulling up to the 18th hole at the U.S. Open while Tiger Woods is putting for the win and breaking his concentration because you decided to watch the scene at the end of Caddyshack where Bill Murray blows up the whole damn course trying to nail the gopher" my response is: there's always the 19th hole.

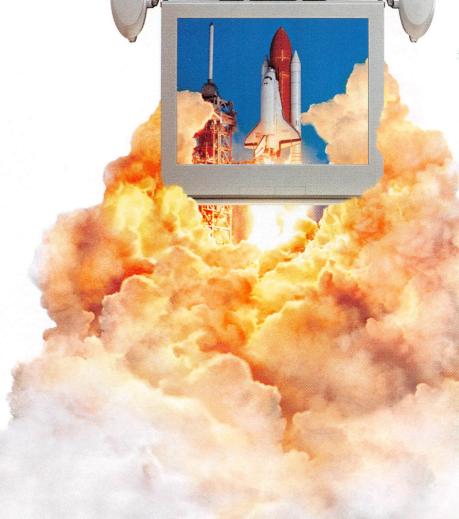
Mike Mettler, a lefty golfer and editor in chief of Car Stereo Review's Mobile Entertainment, is futilely teeing off whenever he can to try and shave his over-30 handicap.



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movies



CAST AWAY

20th Century Fox

Movie ***

DVD ***

n this modern-day Robinson Crusoe tale,
Tom Hanks plays Chuck Noland, a Fed
Ex executive whose life is driven by the
clock. A last-minute flight during the
Christmas season changes all that when the
jet crashes into the Pacific Ocean, leaving
Noland stranded on a small tropical island
which for the next four years will be his
whole world.

The beginning and end of *Cast Away* are a waste, full of noisy, cardboard-cutout characters and contrived situations. And though director Robert Zemeckis tells us in his com-

mentary that having Helen Hunt in the movie provided a strong alternate presence, all of her scenes are forgettable. The story of Noland's time on the island, however, is first-rate moviemaking, and there's not one

STAR SYSTEM

Stellar

Excellent

Good

**

Fair

Poor *

Movie refers to the original film. **DVD** refers to the film's presentation on disc, including picture and sound quality as well as extras.

scene of it that I'd want to cut. It's Hanks, with his beautifully understated acting, who really makes this movie strong. Surely this consummate actor deserved last year's Academy Award over Russell Crowe, who merely provided *Gladiator* with a hunk to look at.

In this THX-supervised double-DVD set, the picture is sharp but smooth. On a small screen, it is easy to tell that the special effects aren't real, the digital water effects looking especially unnatural. The sound, however, is effectively immersive, on both the Dolby Digital Surround EX and DTS-ES tracks. The back surround channel helps tremendously in sorting out complex action scenes as well as providing seamless atmosphere.

The commentary track is an intelligent discussion between Zemeckis and the production crew. The second disc contains a sea of other extras, including Hanks's interview with Charlie Rose, five featurettes, a gallery of conceptual art, and a collection of trailers. There are also some storyboard-to-film comparisons that are particularly interesting, each drawing being placed beside the corresponding still frame from the movie (instead of the usual clip), allowing for greater study. All in all, this set is quite an achievement. English, Dolby Digital Surround EX, DTS-ES Matrixed Surround, and Dolby Surround; French, Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; two dual-layer discs. Rad Bennett

CROUCHING TIGER, HIDDEN DRAGON

Columbia TriStar

Movie ★★★★ DVD ★★★★

nyone who thinks that the martial arts on screen means Bruce Lee or (heaven forbid) Steven Seagal should run to his nearest video outlet and buy the DVD of last year's most enchanting, original, and entertaining film. Its fight scenes, choreographed in the manner of the most detailed and artistic dance sequences, are often simply breathtaking. But director Ang Lee (Sense and Sensibility) doesn't stop there. Crouching Tiger, Hidden Dragon also soars as a romance, a fable, a showcase for Hong Kong megastars Chow Yun-Fat and Michelle Yeoh, and a meditation on the nature of identity and the individual's place in the world.

My expectations were high that this would be a great-looking DVD. Thankfully, the transfer didn't disappoint me. The picture quality of the all-important fight scenes in particular is rock-solid, and the detailed and atmospheric Dolby Digital 5.1 soundtrack is also impressive. Extras include a short doc-

umentary, an interview with Yeoh, and an annoying commentary in which Lee and producer James Schamus talk over one another. No matter: the movie itself is so rich, it requires several viewings just to take it all in. What more could you want from a DVD? Mandarin, Dolby Digital 5.1; English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; dual layer. Ken Korman

UNBREAKABLE

Buena Vista

Movie ★★★★ DVD ★★★★★

ike its predecessor, The Sixth Sense, writer/director M. Night Shyamalan's Unbreakable is suspense at its best, creating a world where the fantastic emerges effortlessly from the rhythms of everyday life. It would border on the criminal to give away its myriad twists and turns, but suffice it to say that Unbreakable tells the story of the sole survivor of a train wreck (a strong Bruce Willis), who is led on a path of discovery by an eccentric and charismatic stranger (Samuel L. Jackson, solid as always).

This two-disc DVD set is to be savored. The THX-supervised transfer is superb, drawing plenty of detail from a mass of contrasting images. Dimly lit sequences are often juxtaposed with bold — and relevant — splotches of color. In fact, I recommend liberal use of the still-frame function; Shyamalan's compositions are beautiful, meaty, and always in the service of the story.

Unbreakable is the first title in Disney's Vista series of bonus-filled DVD packages,



Tiger balm: Chang Chen and Zhang Ziyi in Crouching Tiger, Hidden Dragon

and the extras here include a commentary by the director and cast, eight deleted scenes, and a multi-angle look at a key sequence. There's also an excerpt from a Shyamalan short movie and a featurette on the more important comic-book artists. This is simply the best DVD I've come across so far this year. English, Dolby Digital and DTS 5.1; French and Spanish, Dolby Digital 5.1; letterboxed (2.35:1) and anamorphic widescreen; one single- and one dual-layer disc. Marc Horowitz

TRAFFIC

USA

Movie ★★★★ DVD ★★★★

our Oscars hardly seems enough for Traffic, director Steven Soderbergh's superbly crafted mosaic on the international drug trade. Taking full advantage of a lean script by Stephen Gaghan, Soderbergh manages to portray a woefully complex problem without resorting to sentiment, preachiness, or irony. The film's interlocking stories in-

volve a resourceful Mexican cop (Benicio Del Toro) who struggles with the temptations of corruption, a Federal drug czar (Michael Douglas) facing his own daughter's addiction, and a wealthy suburban housewife (Catherine Zeta-Jones) who suddenly learns her husband is a drug lord.

Soderbergh uses different color filters to give each story its own look and feel - and help viewers keep track of the story lines. This makes the movie potentially difficult to transfer to DVD, but the disc preserves the all-important variations. Some viewers may reach for the tint control, but Traffic here looks exactly as it did in theaters. The Dolby Digital 5.1 mix likewise handles abrupt transitions from soft dialogue to explosive action. There are no substantive extras here, so don't be surprised if a special edition arrives later. English with Spanish sequences, Dolby Digital 5.1 and Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.

Ken Korman

Graphic violence: Samuel L. Jackson in Unbreakable



SHADOW OF THE VAMPIRE

Universal

Movie ★★★ DVD ★★★

hadow of the Vampire's fantastic premise is, to say the least, original. It proposes that Max Schreck — the actor famed German Expressionist director F. W. Murnau chose to play the title role in his 1922 horror masterpiece, Nosferatu — was a real vampire. That it all works in a nightmarish style worthy of Murnau himself is thanks to the combined talents of actors John Malkovich and Willem Dafoe, writer Steven Katz, and especially director E. Elias Merhige, who weaves an eerie, atmospheric spell that is both chilling and often morbidly hilarious.

Cinematographer Lou Bogue's dark, creepy, 2.35:1 widescreen images of Eastern Europe have been beautifully transferred to DVD along with an unnervingly surrounding Dolby Digital 5.1 mix of the soundtrack, which further envelops viewers in an engaging web of evil. Extras include interviews with the cast and crew, a making-of featurette, a witty commentary by Merhige, and make-up and production photo montages. English, Dolby Digital and DTS 5.1; French, Dolby Digital 5.1; letterboxed (2.35:1) and anamorphic widescreen; dual layer.

Mel Neuhaus

WHAT WOMEN WANT

Paramount

Movie ★★★ DVD ★★★★

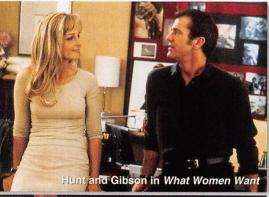
PAY IT FORWARD

Warner

Movie ★★ DVD ★★★ →

If recent DVD releases are anything to go by, Helen Hunt suddenly seems to be the actress of choice for Hollywood date movies. In the lightweight What Women Want, she doesn't have to stretch much as Darcy Mc-Guire, a smart, sexy advertising director chosen for a position that was expected to go to Nick Marshall (Mel Gibson). Following a serious electric shock, Marshall finds himself able to hear women's thoughts, allowing him to act like a seemingly sensitive guy, which McGuire can't resist. It's a one-joke movie, but it's a good one, and there are some very funny scenes, notably the one in which Gibson receives his revelatory buzz while trying on women's accessories.

In *Pay It Forward*, Hunt successfully meets a greater challenge, playing against type as a bitter, recovering-alcoholic mom. Her young son (Haley Joel Osment) comes up with a





Reference

VERTICAL LIMIT

Columbia TriStar

Movie ★★★ DVD ★★★★

If there's an upside to mountaineering, you won't be able to glean it from watching *Vertical Limit.* From start to finish, the cast of climbers in this story of an ill-fated attempt to scale the world's most dangerous

peak are repeatedly subjected to avalanches, entombment in ice caves, and other acts of God. And then there's a brilliant rescue mission (involving sticks of nitroglycerin) that kills more people than it saves.

The script may be over the top, but *Verti*-

cal Limit makes for an amazing DVD experience. The highly effective Dolby Digital 5.1 soundtrack loads on bass and directional effects in the numerous disaster setups. But it's also active in the quiet scenes, convey-

ing subtle sounds like wind whipping across a snow-filled valley. Image quality is excellent. Most of the film was shot on location on snow-capped peaks, and both the white powder and the rocky crags beneath come across with incredible detail. Also, the

climbers' colorful jackets and camping gear are intensely vibrant, and their flesh tones always look natural.

The extensive supplements include a director's commentary, a making-of documentary, and a *National Geo*graphic featurette plus

recountings of search-and-rescue missions.
English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.

Al Griffin

pass-along-a-good-turn scheme that seems to fail initially but ultimately touches more lives than he could have imagined. Except for a contrived *Field of Dreams*-style ending, the movie is reasonably effective and easy to take, even if the script does let the actors down occasionally.

Each disc contains a razor-sharp DVD transfer and impressive, accurate sound. And each comes with an intelligent director's commentary, short on ego and long on information, as well as entertaining (if somewhat fluffy) production featurettes. Both: English, Dolby Digital 5.1 and Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer. What Women Want: French, Dolby Surround. Pay It Forward: French (Quebec), Dolby Digital 5.1.

O BROTHER, WHERE ART THOU?

Touchstone

Movie ★★★★ DVD ★★★★

raternal filmmakers Joel and Ethan Coen (Fargo) hit a home run with this unique comedy. Taking a loopy cue from Homer's Odyssey, they set Ulysses Everett McGill (George Clooney) and two other Depression-era fugitives from a chain gang (hothead John Turturro, holy idiot Tim Blake Nelson) on a Deep South odyssey that has more colorful twists and turns than a Rubik's Cube. The three encounter an oracle, sirens, a cyclops (one-eyed con artist John Goodman), and such 20th-century perils as the Ku Klux Klan and campaigning politicians. It's a wildly entertaining carnival sideshow of a film, with snaggletoothed faces straight from WPA pho-

tos and period slang that's almost Shake-spearean in its rhythms.

It's also a joy to listen to, both for the newly recorded traditional and folk songs on its soundtrack and for its pristine Dolby Digital 5.1 mix. Trains and rifle shots are convincing in the rear sound field. Image quality is also superb. Only the extras are disappointing: a plain featurette, multi-angle script-to-story-board comparisons for two scenes, and *Painting with Pixels* — basically a commercial for digital postproduction. English, Dolby Digital and DTS 5.1; letterboxed (2.35:1) and anamorphic widescreen; dual layer. Frank Lovece

THE LOST WEEKEND

Universal

Movie ★★★★ DVD ★★★

THE FORTUNE COOKIE

MGM

Movie ★★★ DVD ★★★

THE APARTMENT

MGM

Movie ★★★ DVD ★★★

SOME LIKE IT HOT

MGM

Movie ★★★★ DVD ★★★★

n Billy Wilder's world, comedy and tragedy are just two sides of the same bounced check. The Lost Weekend (1945), a film that gets to the bottom of the bottle, shows us where nice idealists end up if they don't learn to deal with reality. Its depiction of an alcoholic's life is brutally and beautifully honest and completely nonjudgmental. Although Wilder's films don't have a shred of schmaltz, The Lost Weekend betrays the immense sympathy and compassion for mankind felt by the

hard-boiled director and his co-writer, Charles Brackett

In three MGM comedies (all co-written by I.A.L. Diamond), more fun is derived by dividing players into two different camps. But they aren't merely "good" or "bad." The opportunistic, cynical hustlers - like Whiplash Willie (Walter Matthau), a crooked lawyer out to screw the insurance companies in The Fortune Cookie (1966), or the charmers who seduce women with a sad story in The Apartment (1960) and Some Like It Hot (1959) tend to also be smart, funny, and colorful. Their innocent opposites, played to perfection by Jack Lemmon in all three comedies (and several other Wilder films), are not only sweet and kind but also somewhat naive, humorless, and dull. Above all, Wilder is a humanitarian, accepting (even celebrating) the weaknesses and vices that make us human.

All four DVD transfers of Wilder's masterfully communicative compositions have pretty good contrast (with rich blacks and slightly gray whites) and fair detail. The comedies have generally clean and sharp transfers, but The Lost Weekend seems to have been made from a more grainy, fluttery, scratched, and dirtspecked print. However, the film is so gripping from the opening shot that you'll barely be conscious of the picture's inadequacies. The sound on all four is a fine, clear mono. Some Like It Hot also comes with a forced 5.1-channel mix, but I found it only distracting to hear occasional sound effects from the surround speakers, and the original mono seemed cleaner than the rather muffled remix.

None of the discs come with supplements except the comic masterpiece Some Like It Hot, which has some very decent extras. The

best of these is a fine 30-minute reminiscence by Tony Curtis with prompts by Leonard Maltin. There's also a Memories from the Sweet Sues featurette, five montages of neverbefore-seen photos of cast and crew, and the trailer to this and six other Wilder films. The Fortune Cookie and The Apartment: English and French, Dolby Digital 2-channel mono; letterboxed (2.35:1) and anamorphic widescreen; dual layer. The Lost Weekend: English, Dolby Digital 2-channel mono; full frame (1.33:1); single layer. Some Like It Hot: English, Dolby Digital 5.1 and Dolby Digital 2-channel mono; French and Spanish, Dolby Digital 2-channel mono; letterboxed (1.66:1) and anamorphic widescreen; dual layer. Josef Krebs

M. HULOT'S HOLIDAY

Criterion Collection/Home Vision Movie ★★★★ DVD ★★★★

MON ONCLE

Criterion Collection/Home Vision Movie ★★★★ DVD ***

PLAYTIME

Criterion Collection/Home Vision Movie ★★★★ DVD ★★★★

n 1953 Jacques Tati, the French comic and director, unleashed a classic character — Monsieur Hulot, a gangly, self-possessed, sweet-souled klutz - in a classic slapstick comedy, M. Hulot's Holiday. Tati's skewering of that French institution, the seaside vacation, consists of one lovely, hilarious sight gag after another as Hulot nonchalantly stumbles from one disaster to the next. By movie's end, you may also realize that Tati is paying wistful homage to a world about to fade away.

Hulot is one eccentric among many in the shabby, charming Parisian neighborhood of



Jacques Tati in M. Hulot's Holiday

Mon Oncle, the Best Foreign Film of 1958. A few blocks away, his sister lives with her pompous husband and their son in an outrageous, ultra-modern house that remains a triumph of art direction. The contrast between the old, doomed to demolition, and the new, which usually gets the best of Hulot, is the film's real narrative.

In Playtime (1967), Paris has become a monochromatic desert of Bauhaus skyscrapers, which Hulot flits in and out of, no more lost than anyone else. Tati jettisoned conventional narrative outright in favor of a vast visual world (and the movie bankrupted him). The sheer scale of man's folly is expressed in more sight gags, some quite subtle, than can be caught in a single viewing.

The digitally restored transfers of Holiday and Mon Oncle are glorious. Holiday looks crisp, with the numerous deep-focus sight gags clear and readable. Mon Oncle stays sensitive to the differences in lighting between its two worlds. Playtime, shot in 70mm before being released in 35mm prints, remains true to Tati's extra detail and depth. Each film comes with a Tati short and an introduction by Terry Jones of Monty Python, who shows us just what to watch for. M. Hulot's Holiday: French and English, Dolby Digital mono; full screen (1.33:1); single layer. Mon Oncle: French, Dolby Digital mono; full screen (1.33:1); single layer. Playtime: French, Dolby Digital mono; letterboxed (1.85) and anamorphic widescreen; dual layer. Sol Louis Siegel

Boys in the band: Tony Curtis (left) and the late Jack Lemmon in Some Like It Hot



BEFORE NIGHT FALLS

New Line

Movie ★★★★ DVD ★★★★

hen is a historical epic not a historical epic? When it comes from the mind of world-renowned painter and sculptor Julian Schnabel. With Before Night Falls, Schna-



DUETS

Hollywood

Movie *** DVD ***

This often very funny Gwyneth Paltrow/Huey Lewis vehicle got dismissed as a sort of vanity project (Paltrow's father, Bruce, directed), but it's actually a lot better than its rep. Set in the heretofore little-documented karaoke subculture, it's like a black-comedy version of *The Hustler* with musical numbers instead of pool games. The large ensemble cast is terrific, and the disc itself looks and sounds great. Extras include a commentary, deleted scenes, and a multi-angle music video. A very pleasant surprise. English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer. *Steve Simels*



Gwyneth Paltrow, Huey Lewis in Duets

BEST IN SHOW

Warner

Movie **** DVD ****

Viewers may know Christopher Guest as Nigel Tufnel, the unforgettably dim-witted lead guitarist of mock-rock group Spiñal Tap. But co-writer/director Guest is an auteur in his own right, as proved by this subtly hilarious satire of dog owners and their private obsessions. Best in Show's Tap-like documentary feel suits the material perfectly, but it doesn't result in a show-case-quality DVD transfer. Instead, the disc's strong points are the movie and some nice extras, which include Guest and co-writer Eugene Levy's commentary and 30 minutes of very funny deleted scenes. English and French (Quebec), Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic widescreen; dual layer. Ken Korman

THE HOUSE OF MIRTH

Columbia TriStar

Movie **** DVD ****

X-Files co-star Gillian Anderson gives an emotionally shattering performance as a doomed misfit in the note-perfect adaptation by director Terence Davies of Edith Wharton's study of class warfare in fin de siècle New York high society. Gorgeously photographed and art-directed, the film gets the painterly, reference-quality transfer it deserves. There are a few austere bonuses, the most interesting being some deleted scenes with commentary by Davies, but it's Anderson's haunting descent into madness you'll remember. English, Dolby Digital 5.1 and Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; dual layer.

Steve Simels

QUILLS

20th Century Fox

Movie ★★★★ DVD ★★★★

The story ultimately ends in tragedy, but there's still plenty of fun in the battle of wills between the institutionalized yet unrepentant Marquis de Sade (a thrilling Geoffrey Rush) and the asylum administrators (Joaquin Phoenix and Michael Caine, with Kate Winslet as his laundress accomplice). The muted richness of the colors and the almost tactile texture of fabrics and stone walls bring the 18th century to life. Solid factual supplements include three featurettes and a commentary. English, Dolby Digital 5.1 and Dolby Surround; French, Dolby Surround; letterboxed (1.85:1) and anamorphic widescreen; dual layer.

Frank Lovece

ALL THE PRETTY HORSES

Columbia TriStar

Movie ★★ DVD ★★ 1

The first cut of this movie is said to have been four hours long, and paring it down to 117 minutes has done serious damage. What remains is a likable but very confusing tale of two young men who go looking for the Old West. I can admire the gorgeous outdoor vistas and marvel at the effective use of surround sound in this extremely well-produced DVD, but I hope that a director's cut might soon be in the offing that would make the story more cohesive. English, Dolby Digital 5.1 and Dolby Surround; letter-boxed (2.35:1) and anamorphic widescreen; dual layer.

Rad Bennett

BIG TROUBLE IN LITTLE CHINA

20th Century Fox

Movie ★★★★ DVD ★★★★

How apt that John Carpenter's intoxicating 1986 tour-de-force supernatural action-comedy prefiguring Americans' fascination with Asian adrenaline cinema - should contain one of the most diverting commentaries. The DVD transfer is excellent, too, showcasing cinematographer Dean Cundey's gorgeous Panavision images, and the Dolby Digital 4.1 soundtrack is filled with spectacular surround effects. An entire disc of extras includes deleted scenes, a featurette articles interviews and a music video English, DTS 5.1, Dolby Digital 4.1, and Dolby Surround; French, Dolby Surround; letterboxed (2.35:1) and anamorphic widescreen; Mel Neuhaus two dual-layer discs.

DRACULA 2000

Dimension

Movie ★★★ DVD ★★★↓

Director Patrick Lussier's update of the old vampire saga is exceptionally stylish, gory as hell, often quite funny, and full of *Matrix*-ian battle scenes featuring toothsome undead babes. The disc looks great, even in the darkest nighttime scenes, and the extras include a nice commentary by the director, deleted scenes, a making-of featurette, storyboards, and some audition footage. English and French, Dolby Digital 5.1; letterboxed (2.35:1) and anamorphic widescreen dual layer.

Steve Simels

bel the director takes us through 40 years of tumultuous Cuban history by focusing on the life of one of the country's least-favored but most talented sons, novelist Reynaldo Arenas. He was persecuted in Fidel Castro's Cuba for both his artistry and his homosexuality, and that story — based on his memoir of the same title — pulls no punches in depicting the horrors suffered by "counter-revolutionary" Cubans. Fittingly, though, the film also contains many scenes of indescribable grace and beauty. The deservedly Oscar-nominated performance by Javier Bardem in the title role helps, too, as does the picture's having been given the kind of rich, cinematic DVD transfer sometimes reserved for bigger-budget movies.

The big surprise, though, is a superbly appropriate package of extras, including a commentary by Schnabel, Bardem, and assorted filmmakers, a fascinating interview with Arenas, and a revealing tour of Schnabel's New York art studio and paintings. It's all as refreshing as an island breeze. English, Dolby Digital 5.1 and Dolby Surround; Spanish, Dolby Digital 5.1; letterboxed (1.85:1) and anamorphic widescreen; dual layer. *Ken Korman*



Coming Releases

CITIZEN KANE

This two-disc 60th-anniversary edition has a transfer from a newly discovered fine-grain positive master and revitalized audio. Extras include commentaries by Roger Ebert and Peter Bogdanovich and the two-hour documentary *The Battle over Citizen Kane*. Warner, Sept.



DOCTOR WHO

Three DVD titles from the classic British sci-fi series featuring the intrepid Tardis timetraveler: The Five Doctors, Spearhead from Space, and The Robots of Death. Each comes with a commentary. BBC Home Video, Sept.

FAWLTY TOWERS

The complete series in a three-disc set (four episodes per DVD). Includes a commentary and interviews. BBC Home Video, Oct.

STAR WARS: EPISODE I — THE PHANTOM MENACE

Two-disc set with a THX-approved anamorphic widescreen transfer and a Dolby Digital Surround EX soundtrack. Includes a commentary plus a whole disc of extras. Lucasfilm/20th Century Fox, Oct.

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FLEETWOOD MAC

Rumours

Warner Bros. (DVD-A)

Music ****

Recording ★★★★

BILLY JOEL The Stranger

Columbia (SACD)

Music ★★★★ Recording ****

h, now we're talking. . . . Yes, we've already seen and heard some fine surround titles on DVD-Audio and Super Audio CD, but if multichannel music is going to win over the masses, it's going to do it with albums like these. Both are from 1977, both are arguably the signature works of their creators, and both have been remixed for six channels by recordists who were there. How could I resist letting them go head to head?

Beginning alphabetically, by artist and by format, we have Fleetwood Mac's Rumours on DVD-A. Please, a moment of silence for one of the best-selling and simply best albums of all time. . . . Now, how can anyone make the best better? Rumours was originally produced by the band with the album's engineers, Richard Dashut and Ken Caillat. Today, Dashut and Caillat are two of the principals of the 5.1 Entertainment Group, which releases its own DVD-A titles on the Silverline label. But Caillat took a busman's holiday to remix Rumours, and the result is

his most accomplished surround work to date. In the finale of "Second Hand News," the harmonies blossom all around, and the guitar solo has new bite. In "Dreams," the harmonies are placed so well that you can hear nearly every part. And in "Never Going Back Again," the acoustic guitars are balanced evenly in the four left/right channels, and they're clearer than they've ever been.

But there are times when Caillat's mix meddles. Go back to "Never" and you'll notice that Lindsey Buckingham's vocals, originally intimate, now sound overdone because they're panned across the three front channels as well as the two surround channels. And whereas the background harmonies of "News" and "Dreams" are solid, the lead harmonies of "The Chain" and "I Don't Want to Know," spread over five channels, are ultimately spread too thin.

cludes alternate material. I am not a fan of putting this in the main program; bonuses should appear as bonus tracks. That said, the extra guitar and snare on "Never" are inter-

There are other times when the mix in-

esting. But I don't know what alternate material (or what simple mistake) caused "The Chain" to have four full-band riffs before the vocal outro instead of the original five. And I'm disappointed that the DVD-A repeats the CD's errors of starting "Gold Dust Woman" at full volume (instead of fading it in) and ending the song by covering up Stevie Nicks's wailing - an especially frustrating mishap when the onscreen notes tell us that

> Those notes aren't much, as they're mostly excerpts from something a lot meatier: a commentary track involving all five band members. It's often wonderful - explaining, for example, why the B-side "Silver Springs" is now back on the album. Sometimes, though, you have to strain to hear the commentary because the level of the accompanying music is too high. Then again, you may find yourself straining to hear the music instead because it's an instrumental version of the album and includes some demo material! Why can't we access that separately? And why does the disc further distract from the commentary by illustrating it with a remote-controlled photo gallery?

her wailing is "one of her favorite parts."

Yes, this Rumours does sound better than any other Rumours in your collection, no contest. But our "Recording" rating must take into account the strengths and weaknesses of the surround mix and the extras. Hence, that rating for Rumours on DVD-Audio stops at $3\frac{1}{2}$ stars.

On the other hand, there's little stopping Billy Joel's The Stranger from earning a fivestar rating - so marvelous is the remix for multichannel Super Audio CD by the album's

STAR

Excellent

Good

Poor

Music refers to content alone. Recording refers to sound quality and, where applicable, multichannel mix.

original producer, Phil Ramone. I've docked it just half a star for a few overprominent surround-channel placements, notably the acoustic guitar on the bridge of the title track and the sax solo on "Only the Good Die Young."

Otherwise, where do I begin to tell young.

Otherwise, where do I begin to tell you how great this SACD sounds? I could begin at the beginning, where "Movin' Out (Anthony's Song)" burbles and punches in all the right places, at all the right levels. Similarly, the circular acoustic-guitar pattern in "She's Always a Woman," basically lost on CD, is beautifully precise in the surround channels.

I could also begin by telling you that Joel's voice sounds vivid when anchored in the center channel for six of the album's nine songs. It's also effective when expanded for "Just the Way You Are" and "Vienna," with primary vocals in the front left and right channels and ambience elsewhere (if a bit too much ambience for the former song). You may be startled when Joel rallies from the center and surrounds for "Only the Good Die Young," but I have a hunch that Ramone delighted in this, hoping we'd recall the same virginal pressure that Virginia has felt all these years.

And that's really the beginning, middle, and end of what I want to say about *The Stranger* on SACD: it seems like Ramone had *fun* with the remix. Both *Rumours* and *The Stranger* take full advantage of the surround channels, but whereas Caillat seems to be using them to make a bold multichannel statement, Ramone puts the mix at the service of the music.

Also, there's a liveliness to the instruments on *The Stranger* — and a definable space between them. *Warning to boosters of either surround format:* This is not to say that SACD "sounds better" than DVD-A. I would be loath to say any such thing, in either format's favor, without intensive, direct comparison of identical material. What's going on here may be partly a result of the character of the original recordings. *Rumours* can still seem like a relic from the 1970s. *The Stranger* sounds much more modern.

By the way, *The Stranger* has no extras, per Sony Music's policy for SACD. But considering the Warner Music Group's spotty record in this department for DVD-A, Sony isn't necessarily at a disadvantage.

All of the above leads to one final point: *Rumours* is only available on DVD-Audio. *The Stranger* is only available on Super Audio CD. Which format will you choose? If you want both albums, will you invest in both formats? We're now at the point in the infancy of multichannel music where the audio and music industries are dying to hear your answers.

Ken Richardson

JOE STRUMMER AND THE MESCALEROS

Global a Go-Go

Hellcat/Epitaph

Music ★★ Recording ★★★

as modern rock seen any greater underachiever than Joe Strummer? Fifteen years after the breakup of the Clash, all he had to show was an instant-cutout solo album, a few film soundtracks, and a brief but promising stint as the Pogues' replacement frontman. When he finally reappeared with the Mescaleros on 1999's *Rock Art and the X-Ray Style*, it was a blurry mix of rock, rap, and worldbeat that sounded like a follow-up to the Clash's last and worst album, *Cut the Crap*.

Global a Go-Go is no return to glory, but it's a step in the right direction. Again, it's



Hall the Gultar

Or, as *Rolling Stone* put it at the start of the summer, "Hard Rock to the Rescue." The music industry needs saving, it seems, and some people were hoping that high temperatures plus heavy sounds would equal big bucks. Well, the summer is nearly over. Rescue mission accomplished? Whatever the outcome, these eight albums prove there's more than one way to stroke an ax.

"Hail the guitar" is actually a line from the **Cult**'s *Beyond Good and Evil* (Lava/Atlantic; Music $\star\star\star$, Recording $\star\star\star$). There are some good linear riffs here, but if the best hard rock owes something to the Led Zeppelin Theory of Shadows and Light, the Cult wouldn't know a shadow if one snuck up from behind and bit 'em in the ass. At the other extreme, **Tool**'s *Lateralus* (Tool Dissectional/Volcano; Music $\star\star\star$, Recording $\star\star\star\star$) boasts a nearly 80-minute playing time but fritters much of it away just tooling around. It's adventurous, though; not for nothing are these guys touring with King Crimson.

Beautiful Creatures strike a good balance on their self-titled debut (Warner Bros.; Music $\star\star\star\star$, Recording $\star\star\star\star$), a scruffy riff-fest in the tradition of AC/DC and Buckcherry, leavened with catchy choruses and acoustic souse-alongs. **Saliva** tempers its more metallic approach with rap-rock verses in "Your Disease" and other songs on *Every Six Seconds* (Island; Music $\star\star\star$, Recording $\star\star\star$), a tactic that's unnecessary but not unexpected from a band that aims to please, right down to the CD booklet's visions of jailbait.

"It's Been Awhile" since **Staind** hasn't been at the top of both the mainstream and modern rock charts — and that's okay, because *Break the Cycle* (Flip/Elektra; Music * * * * * * * , Recording * * * * * * *) shows the band to be a deft outfit. Still, singer Aaron "It's always raining in my head" Lewis has to learn to lighten up, and his mates should allow themselves to mature à la Pearl Jam or . . . **Stone Temple Pilots**, whose *Shangri-La Dee Da* (Atlantic; Music * * * * * * , Recording * * * * * * *) is rock

hard-guitar record, pure and simple. Ignore it at your peril.

& roll & then some. Tough pop, rough metal — it's Shadows and Light done right. If you want it done different but still done with guitar, try *Welcome to the Western Lodge* (Spitfire; Music ***, Recording ***), the return of **Masters of Reality**. Mastermind Chris Goss rides the buzz and fuzz he gave Queens of the Stone Age as co-producer of *Rated R*. But if you try anything, try the **White Stripes**, whose *White Blood Cells* (Sympathy for the Record Industry; Music ****, Recording ***) is as elemental as the Who's *Live at Leeds* — especially since this is just a duo playing guitar and drums. Yes, you *can* love distortion and tape hiss! The rock-critic intelligentsia keeps citing the band's blues and garage influences. I hear an amazing

More in common than you think: (from top) Tool, Stone Temple Pilots, White Stripes





Ken Richardson



less about songs than grooves, with as much programming as playing. It just seems more spirited this time, and the sound of Strummer's voice in breathless "London Calling" mode is enough to excuse the lack of lyrical focus. (The best lyric, "Bummed Out City," sounds like an apology for the years he's let slip by.) Acoustic instruments (mainly violin) make more of an impression, though he finally remembers to throw in some punk guitar on the title track. The album gets bogged down with too many dirges in the second half, and I'm hoping that the 18-minute instrumental finale was meant as a joke. The record label's comparisons to Van Morrison's Astral Weeks are strictly wishful thinking, but at least Strummer has made it back to the feel of the Clash circa Combat Rock, when the spirit was waning but still present. Brett Milano

AIR 10,000 Hz Legend

Astralwerks

Music **** Recording ****

I AM THE WORLD TRADE

CENTER Out of the Loop

Kindercore

Music ★★★ Recording ★★★ arisians Jean-Benoit Dunckel and Nicolas Godin, a.k.a. Air, were part of that late-1990s miracle when actual good music was coming out of France. The nostalgic electrobeat of their debut, Moon Safari, was a hit with critics and led to another big break, scoring The Virgin Suicides. Now comes 10,000 Hz Legend, and despite the claim that much of the material was done in just one take, the tracks have a full cinematic sound. But you can also hear the duo reaching for a lowbrow American idiom. "The Vagabond" features Beck on vocals (and concept) - need I say more about the American thing? All this is processed through Air's hip sensibility and the obligatory French eroticism (naturellement!), and the result is — well, kind of like the soundtrack for a European film about



young L.A. drifters. In love. With computers. But in true Gallic fashion, Dunckel and Godin take their job as artists seriously, so this is a well-crafted and imaginative work.

In contrast, Americans Dan Geller and Amy Dykes, a.k.a. I Am the World Trade Center, have made a much looser, more fun 'n' funky electronic-pop record. Out of the Loop is not without its own flash and wit; producer/composer Geller draws on an almost Beck-sized array of samples, tricks, and influences to engage the listener, and it works. (Not so great, though, are some out-of-tune vocals.) Overall, Out of the Loop is a good debut. It was recorded, sequenced, and mixed entirely on a Gateway computer, by the way, which is cool. Cooler still is that it keeps its liveliness and humor all the way through - now that's an achievement. emily xyz

TRAVIS The Invisible Band

Epic/Independiente

Music ★★★ Recording ★★★

od bless Travis. Granted, they're not the Kinks, but they are a winsome, heart-on-sleeve quartet whose modest, tuneful approach has won them a sizable following. In a scene dominated by louder, loutier fare, the success of low-key pop bands like Travis and

Train is almost as much cause for celebration as the music itself.

The Invisible Band is another strummy trip through the mind of frontman Fran Healy, a dreamer and romantic given to fits of unguarded good cheer: "It's such a lovely day, and I'm glad you feel the same," he exults in "Flowers in the Window." It takes a certain callow bravado to write a hymn to one's youthful memoirs ("Dear Diary"), much less make it so melodically endearing. Throughout The Invisible Band, the music bobs and weaves pleasantly, evoking a more ethereal U2. In the end, it insinuates itself into your psyche via such unassuming but addictive songs as "Sing" and "Afterglow." Hint: keep listening after Track 12 dies out, because a couple more charmers are buried after three minutes of silence. Parke Puterbaugh

WEEZER

Geffen

Music ★★★ Recording ★★★

BUTTERFLY JONES

Napalm Springs

Vanguard

Music ★★★ Recording ★★★

eezer would seem to be the ultimate dilettante rock band. Its untitled new record (alias "The Green Album") is only its third in seven years, and it comes after a fiveyear layoff during which leader Rivers Cuomo attended Harvard — dropping out, incidentally, a year shy of graduating. The disc lasts all of 28 minutes, making it a minialbum at full CD pricing (and herewith rated accordingly). Other gripes: guitar solos, when they exist at all, do little but briefly restate verse melodies, and Cuomo's affected British accent is annoying. Even so, Weezer's ten punchy hard-pop songs sound both fresh and familiar, like Meet the Beatles! run through a grunge-era sonic slurry. "Hash Pipe" is the catchiest song ever written about a temperamental transvestite. It's followed by "Island in

Pop and Celtic folks at home: Healy (at right in left photo) strikes up a Travis tune, while flutist Madden cherishes her Ladies





TRAVIS, STEFAN RUIZ/EPIC; CHERISH, JEROME FERRANO/WINDHAM HILL

the Sun," an escapist fantasy filled with chiming chords and ringing harmonies. Overall, the CD is half great, all good, and long overdue.

Butterfly Jones marks the return of guitarist/singer Michael Gurley and drummer Phil Leavitt, two thirds of the defunct SoCal progressive-pop trio dada. Unsurprisingly, Napalm Springs sounds very dada-esque in both the playful inventiveness of the tunes and the high caliber of the musicianship. As with the prior band, the weak link is the words, which seldom soar as high as the music. But the listener can only wonder appreciatively at the iridescent sonic architecture of such tracks as the life-affirming "Suicide Bridge" (such a rush!). the heavenly "Blue Roses," and the hurtling, harmony-rich "Sunshine and Ecstasy."

Parke Puterbaugh

CHERISH THE LADIES

The Girls Won't Leave the Boys Alone

Windham Hill

Music ★★★★ Recording ★★★★

LÚNASA

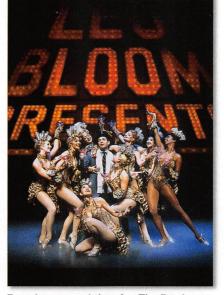
The Merry Sisters of Fate

Green Linnet

Music ★★★★ Recording ★★★★

o get an understanding of just how vibrant the traditional Celtic music scene in the U.S. has been over the last few decades, witness the ongoing success story of the groundbreaking all-female sextet Cherish the Ladies. Led by flute/whistle wizard Joanie Madden (who's from the Bronx), the group has blossomed into an ongoing showcase for some of America's finest Irish musicians female or male. Their eighth album is an inspired joy, and it features a dazzling array of guests, among them such masters of American and Irish folk music as Pete Seeger, Eric Weissberg, Paddy Reilly, and the venerable Clancy clan. There are exhilarating jigs and reels ("The Colliers' Set"), breathtaking ballads ("Bonny Blue-Eyed Nancy"), and rollicking broadsides ("The Mad Puck Goat"). Madden and her crew — pianist Donna Long, accordionist Mary Rafferty, guitarist/banjoist Mary Coogan, and newest members Deirdre Connolly (vocals) and Liz Knowles (fiddle) - play it all with sizzle, spirit, and spunk.

Meanwhile, the future of tradition-based instrumental music in Ireland itself seems in more than capable hands, as evidenced by the third album from Lúnasa. Whether they're tapping into music from Northern Spain ("Casu") or effortlessly shifting tempos midreel ("Aoibhneas"), flutist Kevin Crawford, fiddler Seán Smyth, Uilleann piper Cillian Vallely, guitarist Donogh Hennessy, and string bassist Trevor Hutchinson play with a sense of adventure that's as impressive as their precision-like ensemble work. Billy Altman



Broadway smashtime for The Producers

BUILT TO SPILL Ancient Melodies of the Future

Warner Bros.

Music ★★★★ Recording ★★★★

uilt to Spill shows maturity in a collection of songs propelled less by staggering displays of guitar prowess than by broad, bright melodies. And given axman/frontman Doug Martsch's oddly haunting man-child vocals, thoughtful yet unpretentious lyrics, and penchant for minimalism, Ancient Melodies of the Future manages to sound both innocent and sophisticated.

"Strange" quickly sets the tone, its sweet guitar hooks and steady rhythm complementing Martsch's subdued delivery and offbeat lyrics (the chorus ends, "And it's strange / But what isn't strange / And it's strange / But ... oh, well"). It may sound simple and perhaps a little too cute the first time around, but don't be deceived: underneath, angular riffs rush in to fill gaps and are in turn interrupted by bits of synthesizer. All the while, a hypnotic figure coils itself around the main guitar part and the vocals. "The Host" follows, with Martsch using reverb to create a valley of sound. The album is full of such grand sonic tableaux. And as its title suggests, Ancient Melodies of the Future is a reminder that all memorable rock & roll is transcendent.

Ned Crackel

RON SEXSMITH Blue Boy

Cooking Vinyl/spinART

Music ★★★★ Recording ★★★★ **RUFUS WAINWRIGHT** Poses

DreamWorks

Music ★★★ Recording ★★★★

inger/songwriter Ron Sexsmith's fourth album can be seen as either a calculated attempt at a more commercially viable approach or the result of an imaginative artist's need to expand his musical language. Either way (and it's probably some combination of the two), Blue Boy changes his songs from being leisurely introspective to pleasantly bittersweet. It's a subtle adjustment engineered

by producers Steve Earle and Ray Kennedy, a new rhythmic emphasis that turns Sexsmith's knack for languid melodies into something a little more catchy. But despite the pithy arrangements and more outgoing personas - which include a fairly convincing electricblues guy on "Not Too Big" - Sexsmith's hallmark remains his direct simplicity. Blue Boy may have a little more zip than his previous efforts, but the best cuts ("This Song" and "Tell Me Again") maintain his old wistful minimalism.

Meanwhile, fellow singer/songwriter Rufus Wainwright is also expanding his musical world on his sophomore disc, Poses, adding some busy dollops of sweetening - not that it makes that much difference. Wainwright's virtue and vice is his distinctive vocals, with their combination of world-weary flatness and honeyed mellifluousness. On a relatively concise ditty like "California" or "Rebel Prince" or "One Man Guy" (written by his father, Loudon), it's a sound that can be very appealing. But on the more sprawling songs, like the title cut, he can seem both ponderous and precious. Still, it's a compelling voice and one that would probably come across more effectively in settings a little less grand. Richard C. Walls

THEATER



THE PRODUCERS

Sony Classical

Music ★★★★ Recording ★★★★

BAT BOY

RCA Victor

Music ★★★★ Recording ★★★★

he "concept musical" has arrived, by which I mean a show where the primary attraction is the book rather than the songs or dancing. This doesn't mean the score isn't first-rate - in these two cases, at least. Both The Producers and Bat Boy also consider the musical's relationship to other forms of pop culture. The Producers is Mel Brooks's Broad-



way revision of his own 1968 cult film comedy. Off-Broadway's celebrated *Bat Boy* is allegedly inspired by a typically outrageous headline in the supermarket tabloid *Weekly World News*, but it draws most of its substance from 1950s horror-exploitation flicks in the variety of *I Was a Teenage Used-Car Salesman*.

The Producers is, as everyone knows by now, the biggest hit that Broadway is likely to have for a great many years. Brooks is not a conservatory-trained composer any more than his colleague Woody Allen is a schooled clarinetist, but just as Allen has done a lot of good for New Orleans jazz, Brooks has injected new life into the musical form and come up with some memorably tuney tunes. Bat Boy divides its score between Rocky Horror-style Broadway pop and more traditional show tunes and succeeds on both counts. Of the two productions, Bat Boy is a little easier to actually go and see. But while you're waiting for a ticket to The Producers, you can content yourself with its fine cast album. You can also rent the movie (on VHS) and check out the soundtrack album. Will Friedwald



JANE MONHEIT

Come Dream with Me

N-Coded Music

Music ★★★ Recording ★★★★

TERENCE BLANCHARD

Let's Get Lost

Sony Classical

Music ★★★★ Recording ★★★★

here are those who would dismiss the 23-year-old Jane Monheit as a flavor of the week. I find it encouraging that the neglected art of jazz singing can even sustain such a thing as a flavor of the week. To recap, Monheit, who placed second (following Teri Thornton) in the Thelonious Monk competition a few years ago, made her debut last year with the top-selling *Never Never Land*. This she has now followed with a second album as well as two guest vocals on trumpeter Terence Blanchard's latest CD, a song-driven project built around the melodies of Jimmy McHugh.

Having seen Monheit three times in the last 12 months, I can say that she is indeed making progress and may someday reach the point where she can be compared with veterans and master stylists like Cassandra Wilson and Dianne Reeves — both of whom are also featured on the Blanchard record, as is Diana Krall. But right now, it's difficult for Monheit to keep our interest for a full 11 songs on Come Dream with Me (although this was not a problem at her recent show at New York's Algonquin, where her visual appeal entered into the equation). It doesn't help that she

varies her tempos only between slow and very slow. The winningest tune here is "Hit the Road to Dreamland," the one that comes closest to swinging.

Monheit's best performance on record so far is "Too Young to Go Steady" on Blanchard's Let's Get Lost. This may well be the most user-friendly mainstream jazz album by a major musician since Chet Baker paid homage to Lerner and Loewe; you get familiar melodies, intricate arrangements, and the four best-known singers in jazz today. Still, improvisation remains a key element. Wilson sounds champion here, even though this project takes her outside of the context of the stylistic universe she's been perfecting over the last 20 years — the kind of personal musical vocabulary that Monheit will hopefully develop herself. Will Friedwald

CLASSICAL

VERDI Requiem

Renée Fleming, Olga Borodina, Andrea Bocelli, Ildebrando D'Arcangelo; Kirov Chorus and Orchestra, Valery Gergiev cond. Philips

Performance ***

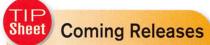
Recording **** Opera Arias

Thomas Hampson; Orchestra of the Age of Enlightenment, Richard Armstrong cond.

EMI Classics
Performance ★★★

Recording ***

ommemorating the centenary of Verdi's death with a recording of his Requiem Mass is a welcome and fitting gesture. Hyping it as "The Ultimate Verdi Requiem" is not, considering how well the work has fared



POWERMAN 5000

Anyone for Doomsday? Hey, we're game! DreamWorks, Aug.

BEN FOLDS Rockin' the Suburbs Solo debut of Ben Folds One. Epic, Sept.

BJÖRK Vespertine TORI AMOS Strange Little Girls BECKY TAYLOR

A Dream Come True

Strange little girls? Björk puts swan dress in closet, resumes career. Tori does covers written by men, sings them from the perspectives of various women. And Becky, doing stage/screen tunes, is her label's "newest and youngest signing, at only 12 years old." Björk: Elektra (CD and DVD-Audio), Aug. Amos: Atlantic, Sept. Taylor: EMI Classics, Sept.



Jane Monheit: if looks could sing . . .

under conductors Carlo Maria Giulini (EMI), Fritz Reiner (Decca), Arturo Toscanini (RCA), and Robert Shaw (Telarc).

Taken on its own terms, this is actually, for the most part, quite a satisfying performance. Russian mezzo Olga Borodina and, to a slightly lesser extent, Italian bass Ildebrando D'Arcangelo have the appropriate vocal and emotional *gravitas* in their solos and provide the strong underpinning that their lower-written parts demand in the ensembles. But despite close miking, tenor Andrea Bocelli lacks the resources required, and his cloying tone and rudimentary phrasing become tiresome pretty quickly. Renée Fleming is far, far closer to the mark in the taxing soprano part, often singing beautifully but ultimately lacking the last degree of vocal heft the part demands.

Conductor Valery Gergiev draws a passionate, often moving performance from his Kirov forces. The bass drum of the *Dies Irae* section for chorus and orchestra, which Toscanini claimed should be loud enough to strike terror in your heart, exploded from my speakers (actually far louder than the cannons on Telarc's Super Audio CD of the *1812 Overture*). While the engineers have done a fine job overall, what good timing it would have been for this to be the first multichannel recording of Verdi's majestic work. Now *that* just might have been "The Ultimate Verdi Requiem."

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f. Digital Effects

Time Code Data Code

I. Photo Search

Remote Control LANC

8. Zoom Handle

ii. VCR Mode Custom Setting Option 1. ON Screen

(two settings for camera mode and two for VCR mode)

Audio adjustments

"See our Website for details"

XL1 / XL1 S Features:

(XL1 features in black/XL1 S additional features in red)

Digital Video Format and IEEE 1394

a. Mini DV

b. IEEE 1394 (DV Terminal)

c. DV Control - Controls External 1394 through DV Cable -REC/REC Pause

Interchangeable Lens System a. XL Mount

• 3 CCD

a. Pixel Shift

b. Super High Resolution and Super Low Light (S/N improved 4dB

Shooting Modes and Aspect Ratios

a. Shooting Modes

i. Normal Video

ii. Digital Photo Mode

iii. Frame Movie Mode

b. Aspect Ratios

i. 4:3 ii. 4:3 with 16:9 Electronic Guides on Viewfinder

iii. 16:9 (Electronic Anamorphic)

c. Interval Recording
i. Interval: 30sec/1min/5min/10min

ii. Recording Time: 0.5sec/1.0sec/1.5sec/2.0sec

Programmed Auto Exposure

a. Shutter - Priority (TV) [12 steps<1/8 to 1/15,000>] b. Aperture Priority (AV) [9 steps<fl.6 to close>]

c. Spotlight

d. Manual

e. Full Auto (Green Mode)

f. Auto Mode

g. Shutter Speeds [30 steps<1/8 to 1/15,000>]

i. Slow Shutter 1/30

ii. Slow Shutter 1/15

iii. Slow Shutter 1/8

h. Computer Shooting i. Clear Scan (61.9 Hz - 201.5 Hz)

i. AE Shift [13 steps <-2.0 to +2.0>]

i. AE Lock

Shooting Enhancements
 a. SMPTE Color Bars
 b. Power Save

i. Normal Standby

ii.VCR Stop

c. Top Grip w/Recording Control

d. Variable Zoom Speed

i. Grip Zoom - Variable/Low/Medium/High

ii. Handle Zoom - Low/Medium/Fast
e. CHAR REC: Option to Superimpose Data
(year,month,day,hour,minute,second) into Vide
f. Index REC. = "Good Mark Shot"

g. Zebra Level

i. 80/85/90/100/IRE h. EVF Display ON (partly OFF)OFF

Picture Adjustments

a. Camera Color: Color Shift (± 6 steps)
b. Camera Sharpness: Picture Sharpness (± 6 steps)

VISA

c. Camera Color Gain (± 6 steps) d. Camera Setup: Black Level (± 6 steps)

e. Gain Control i. -3dB ii. Auto iii. 0dB

iv. +6dB v. +12dB

vi. +18dB

vii. +30dB

f. White Balance i. Auto

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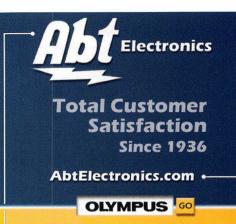
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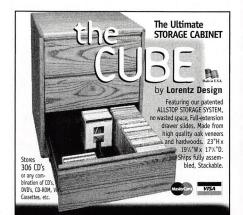
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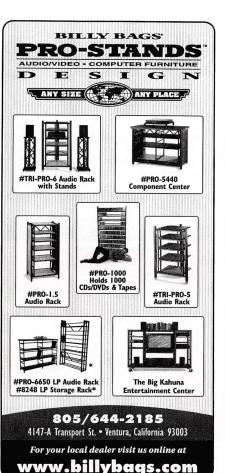
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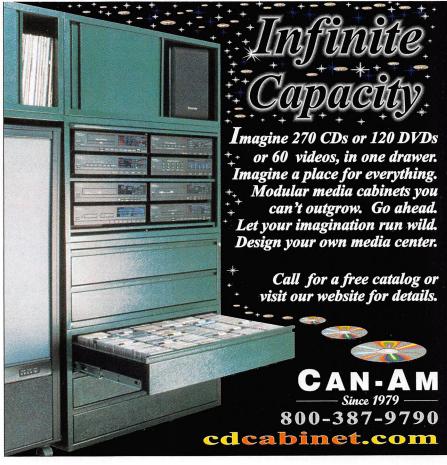


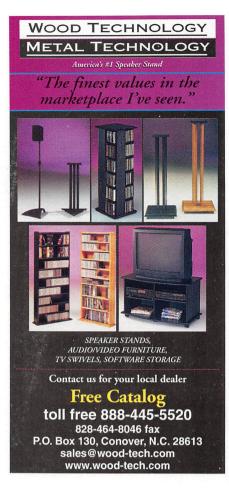
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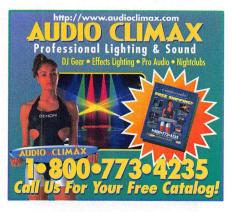
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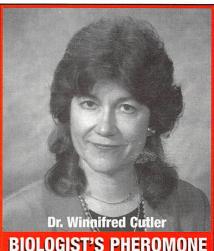
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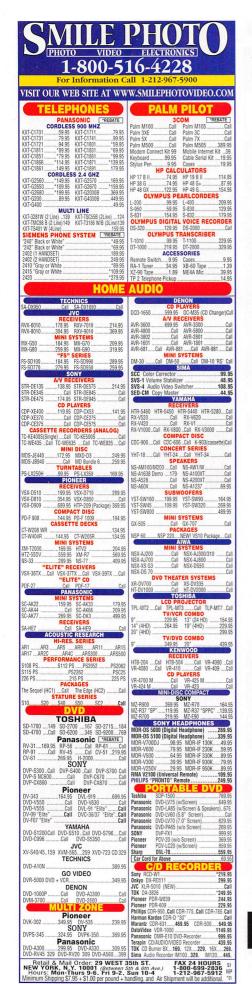
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Robert Deutsch, SGHT, December 1999 "Allied to this transparency, was a leap in dynamic range from the Quads... widest and deepest soundstage..."

Paul Seydor, TAS, #118
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Steve Guttenberg, Audio, November 1999 "101dB at 12.5 Hz, 110dB at 16 Hz, 114dB at 20Hz..."

Don Keele, Audio, August 1998
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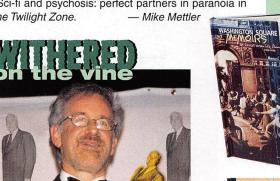
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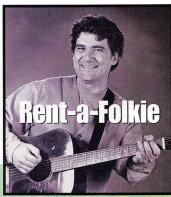
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ubmitted for your approval: all 156 episodes of The Twilight Zone, Rod Serling's masterful 1959-64 black-and-white TV series, available on 45 DVD volumes from Panasonic and Image. My personal favorite is Episode 92, "Person or Persons Unknown" (Volume 32), which concerns a man whose identity is in peril when he wakes up to find that no one recognizes him. Sci-fi and psychosis: perfect partners in paranoia in

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> live Little Niche (\$16), which intersperses songs with comic monologues. Any requests for Don? You can find a few in Rhino's three-disc Washington Square

Memoirs: The Great Urban Folk Boom, 1950-1970 (\$50). To buy Don's CD or book him, visit www.donwhite.net - where you can also contribute to his list of folk jokes, like this one: What do you do with a folk singer on your porch? Pay him for the pizza! - Ken Richardson



A lot of people thought David Lynch doing a G-rated Disney

film was his most perverse gambit yet, but The Straight Story (above) is actually one of Lynch's best efforts — and a real standout in the current stream of hollow, heartless dreck (Disney, \$33). Hollywood has taken frequent stabs at noir-meister Jim Thompson's work (The Grifters, The Killer Inside Me, After Dark My Sweet, The Getaway) but always missed the mark. Not French director Bernard Tavernier, whose Coup de Torchon (based on Thompson's Pop. 1280) gets jaded, nerve-jangling Jim unflinchingly right (Criterion, \$30).

WEB HITS



Heard about Spider-Man appearing in a clip on the X-Men DVD but searched the disc from top to bottom and still no Webhead? This is a job for the Internet! You can learn about all those hidden DVD "Easter eggs" at www.dvdeastereggs.com, www .dvdreview.com/html/hidden_features .shtml, and dvd.ign.com/eggs.html, among others. Crisis averted, Cheater Lad. - Peter Pachal



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Hollywood Close Up If you want to know who played Princess Flavia in the 13th remake of The Prisoner of Zenda or who the key grip's brother-in-law was on the dog of a movie you saw on Insomnia Theater last night, check out the Internet Movie Database (www.imdb.com). It's a seemingly inexhaustible resource for everything about the production. cast members, DVD and laserdisc editions, and every other

detail about every movie you could ever think of. And if you're not a cinéaste, you can always just play the movie trivia and check out the pretty pictures.



It's got Stanley Kubrick's title, only place Kubrick's name appears

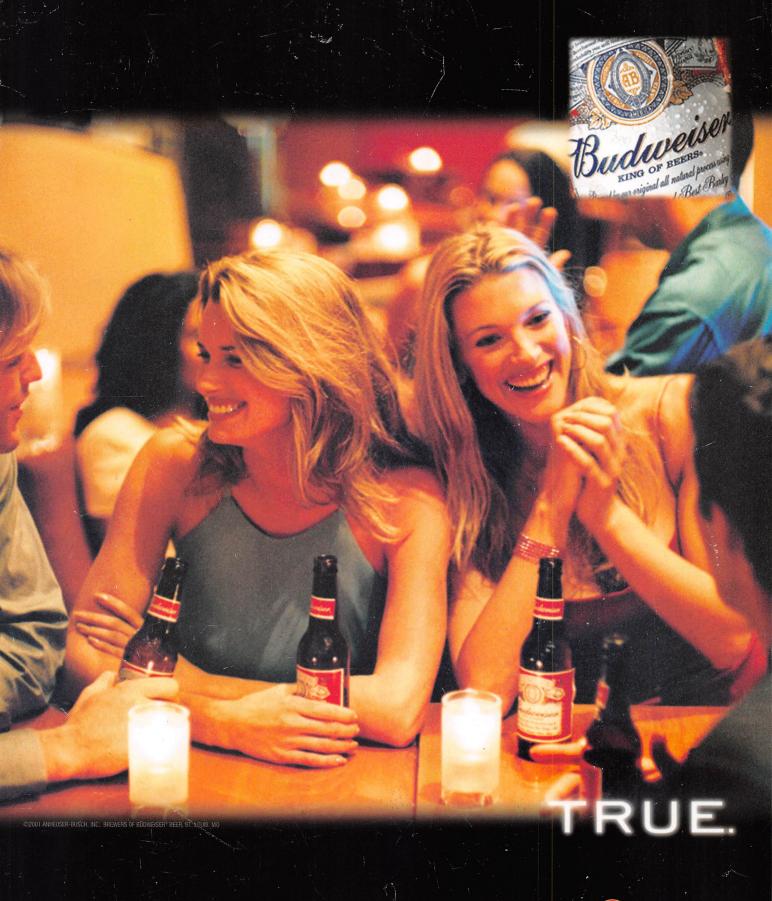


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